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THE OCEAN AS A HEALTH-RESORT

A Handbook

OF

PRACTICAL INFORMATION AS TO SEA-VOYAGES

FOR THE USE OF

TOURISTS AND INVALIDS

BY

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With a Chart

SHOWING THE OCEAN-ROUTES AND ILLUSTRATING THE PHYSICAL GEOGRAPHY OF THE SEA

LONDON
J. & A. CHURCHILL, NEW BURLINGTON STREET
1880

Hazell, Watson, and Viney, Printers, London and Aylesbury

PREFACE.

FREQUENT conversations with the many fellow-passengers I have met in the course of more than one voyage to the Australian colonies have led me to believe that a small handbook, such as the present, might be of considerable use to the constantly increasing class of travellers who, without previous experience of the sea, have determined to try its invigorating or curative effects. I found that many had started with exceedingly dim notions as to what lay before them in their sea-life; that some were inadequately provided with those necessaries of personal outfit which, though perhaps trifling in themselves, are, especially in the case of an invalid, so indispensable to comfort during a long voyage; and that others had formed no definite plans for their stay in the country for which they were bound.

In the following pages I have endeavoured, first, to give such practical information as to routes, shipping-lines, outfit, and all other preliminary matters, as may enable even the most inexperienced traveller to make a judicious choice of a voyage and ship, and to provide himself with all that he will require for the passage out and home. Next, I have tried to present a faithful

picture of life at sea, and of what is to be expected in the way of accommodation, food, and amusement during a long voyage; and I have also described the climate and weather usually experienced during a passage to and from Australia, and have given some hints as to the management of the health, especially in the tropics. A chapter has been devoted to the various objects of interest that are met with at sea, an intelligent appreciation of which will not only lessen the tedium of a long voyage, but will also, by keeping the mind employed, greatly assist the beneficial effects of sea-life. Lastly, some account has been given of Australia and South Africa with special reference to climate and the localities most suitable as a residence for such invalids as, having made the voyage to either of those countries, intend to remain there for a longer or shorter time.

It has been my wish throughout this work to give not only reliable but also thoroughly *practical* information; and if this has led me at times to lay stress on seeming trifles, it must be remembered that comfort or discomfort at sea—particularly as regards invalids—is vastly dependent on little things which to those on shore and in health might appear of the smallest consequence. Again, many of the details given may appear ridiculously unnecessary to those with any previous experience of the sea, but here again it must be borne in mind that this handbook has been written especially for those who have no such knowledge whatever.

Although the voyage to Australia by the Atlantic route has, on account of its many advantages for invalids, been selected as the typical health-voyage, particulars have

been given of various other sea-routes which, though not so suitable for the great majority of those travelling for health—especially if suffering from any affection of the chest—would yet be most enjoyable and prove of the greatest benefit to those requiring change of scene rather than direct climatic treatment.

The track-chart that accompanies this volume will, I believe, be found useful to the reader not only in selecting his route in the first instance, but also, when at sea, in tracing the progress of his voyage from day to day. The "regions" of the ocean, with their physical characteristics, have also been mapped out, and will enable the voyager to estimate roughly the kind of weather to be expected in the various latitudes through which he will pass.

The great advance which has recently taken place in the construction of large, powerful, and commodious steamships for the Australian voyage, will no doubt lead eventually to such improved accommodation for passengers as will not only cause vessels of this class almost entirely to supersede sailing-ships for passenger-traffic, but will also remove many of the objections that now exist to steamers in the case of invalids. Some of these objections, however—such as the too rapid transition from one kind of climate to another—must always remain; and for the present, some of the fine sailing ships which still run to Australia, and are specially arranged for the comfort and convenience of passengers travelling for health, will, I think, afford the most favourable opportunities for reaping the full benefits of a sea-voyage.

I cannot close this short preface without expressing my acknowledgments and thanks to my friend and fellow-traveller, E. Mawley, Esq., F.M.S., for his valuable assistance in compiling the chapter on marine meteorology, and for the complete table of observations taken by him during a homeward voyage from Australia round the Cape of Good Hope.

In conclusion, I venture to hope that these pages may not only prove useful to those who are seeking, in a voyage, a means of regaining health, but that they may also be found to contain some few hints which may be of service to the larger class of travellers who go to sea for business or for pleasure.

SANDOWN, ISLE OF WIGHT,
July, 1880.

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NOTE.—One or two recent alterations with regard to the shipping-lines mentioned in the following pages have come under my notice since going to press. They are as follows: Messrs. Money Wigram & Co. have discontinued their sailing vessels for Australia, and now despatch steamships only to the New Zealand and Australian ports. Messrs. Trinder, Anderson, & Co., of the "Elder" Line, no longer run steamers in connection with their Australian sailing ships.

W. S. W.

THE OCEAN AS A HEALTH RESORT.

CHAPTER I.

CURATIVE EFFECTS OF THE OCEAN CLIMATE.

Conditions of sea-life favourable to the restoration of health—Diseases in which a sea-voyage has been found of benefit—Consumption—Bronchitis—Asthma—The after-effects of inflammation of the lungs, pleurisy, etc.—Nervous complaints—Diseases of joints—Debility—Overwork.

ALTHOUGH the following pages will, it is hoped, be found useful by passengers of all classes, whether invalids or otherwise, who are starting upon a long voyage without any previous experience of the sea; yet, as the work is written with more particular reference to those who are travelling in search of health, the opening chapter will be devoted to considering, first, the particular conditions of sea climate and sea life that exert a beneficial effect upon the constitution; and, second, the various diseases in which a sea voyage has proved most useful.

The curative effects of the true ocean climate in certain cases of illness are now becoming, year by year, better understood and appreciated. While ten or fifteen years ago it was quite an unusual thing to meet, even in the finest Australian sailing vessels, with any one taking a

voyage solely for the benefit of his health, now the favourite passenger-ships, especially in the autumn, are half-filled with invalids of every kind and degree, who are looking forward hopefully to testing the restorative influences of the ocean climate.

But although the remedial effects of a long voyage, especially in well-selected cases of chest-disease, and the invigorating action of the ocean climate upon nearly all who go to sea are now fully recognised, not only by medical men, but by the public generally, the *modus operandi*—the way in which these beneficial results are brought about—is still only imperfectly understood, even by those who have given their best attention to the subject.

It is probable, however, that the rapid improvement which so generally takes place in the health while at sea may be attributed to some or all of the following causes:—

1. The entire change of scene, and the enforced rest from customary occupations.

2. The facilities for being constantly in the open air during the greater part of the twenty-four hours.

3. The habitual respiration, when on deck, of air free from those organic and inorganic impurities, and floating particles of dust and carbon, that are met with in even the purest air on land.

4. The greater equability of temperature at sea.

5. The presence in the air of certain substances, such as saline particles, which may exert a specific beneficial effect upon the lungs and air-passages; also probable differences in the electrical conditions of the atmosphere and in the amount of ozone in sea-air.

6. The sedative influence exerted on the constitution by a comparatively humid atmosphere combined with a high barometric pressure.

7. The bracing and hardening effect of almost constant sea-breezes, and of the changes of climate experienced in passing through the different "regions" of the ocean.

At first sight some of the above conditions might appear to be to a certain extent contradictory. Thus, equability of temperature might seem incompatible with those changes of climate experienced between England and the southern limits of an Australian voyage. A perusal of the chapter on marine meteorology will, however, show that the equability referred to is principally that of *daily range*—those sudden changes of temperature so frequent on shore, often amounting to 15° or 20° in the twenty-four hours, and which are so trying to invalids, being almost unknown at sea, where the extreme daily limits of temperature are usually comprised within 3° or 4°. The transition, too, from the comparative cold of the English Channel to the heats of the tropics, and back again to the cold weather south of the Cape, though great in itself, is accomplished by regular gradations, very different from the abrupt changes of our own climate. Again, the sedative influence of a humid air might appear antagonistic to the bracing effect of sea winds and changes of climate, did we not know that it is often a combination of opposite therapeutical conditions, such as these, which is of the greatest value in the treatment of disease.*

Although a few of the conditions which have been mentioned might, under favourable circumstances, be enjoyed on shore, others are peculiar to an ocean climate far removed

* I much regret that some valuable papers by Dr. Faber, on "The Influence of Sea Voyages on the Human Body," which appeared in the *Practitioner* during 1876-7, did not come under my notice until this work was ready to go to press. I have, however, been able to avail myself of them to the extent of incorporating with my former list of the causes influencing health at sea, some additional ones suggested by Dr. Faber.

from all land influences. Indeed, any one who has been to sea will know that not only does such a climate differ entirely in its effects upon the health and constitution from the *mixed* sea air that is to be obtained on our coasts, but also that an appreciable difference will be felt by delicate persons when approaching even within twenty or thirty miles of land. The peculiar combination of curative influences such as have been enumerated above is, in fact, only to be met with in a well-chosen sea voyage.

It would be obviously out of place, in a little work intended for general use, to attempt to give anything like a detailed account of the diseases in which a sea voyage has been found of benefit; but a few brief and very general observations on the subject may be found of use to non-professional readers. It should, however, be clearly understood that no *invalid* is recommended to take a voyage, except under the advice and with the sanction of his physician or regular medical attendant; for there are special circumstances and peculiarities in the case of every patient which can only be duly weighed by his own medical adviser, after careful and individual examination.

The principal complaints for which invalids have hitherto been sent to sea are consumption, bronchitis, asthma, the after-effects of inflammation of the lungs and pleurisy, nervous complaints of various kinds, scrofulous diseases of joints, debility, the effects of overwork, etc.

Consumption is the illness of all others for which it is now customary to prescribe a sea voyage, although it is only comparatively of late years that this has been the case. There can be no doubt that in the *first* stages of consumption a judiciously selected sea voyage is often of incalculable value. The one great point is to take the disease sufficiently early—if possible, when the first threatenings only have manifested themselves. Every physician is

familiar with cases where, while the patient is still young and the constitution otherwise sound, symptoms arise which, though they might be regarded as trivial by the patient himself, will be at once recognised by the medical man as of grave import, especially if there should be a family predisposition to lung disease. These are, in fact, the "premonitory symptoms" of what may prove serious pulmonary mischief. It is in just such cases as these that a sea voyage acts most beneficially. It will often eradicate the tendency to consumption and establish the constitution for life. Even in those cases where the first stage of the disease is more fully established, a few months at sea will frequently arrest the mischief, and sometimes effect a permanent cure.

It is when the disease has passed into its later stages—when a cavity has formed in the lung—that the advisability of sending a consumptive patient to sea becomes more doubtful. Even then great benefit will sometimes be obtained; but the question whether the possible good that *may* result will weigh against the certain loss of home comforts and the many inconveniences of ship life, is one that can only be decided by the physician in attendance on the case.

Bronchitis and *Asthma* are complaints in which the climate of the ocean seems to be less certain in its action than in consumption. Patients who suffer either from chronic bronchitis, or from winter attacks of acute bronchitis, often derive much benefit from a voyage, not only by escaping the English winter (if they sail in the autumn), but also from the greater equability of the climate at sea, and the opportunities afforded them of being almost constantly in the open air. The colder portions of the voyage are, however, sometimes trying to bronchitic invalids, especially as there is often a good deal of atmospheric humidity accompanying the cold; but I have seldom or never seen severe

attacks of bronchitis occur at sea, and the improvement in the general health usually brought about by the voyage is alone a great point gained. If the destination be Australia or South Africa, the dryness of the climate of either of these countries will render them admirably suited either as a temporary or a permanent residence for most patients suffering from bronchial affections. Asthma—often associated with bronchitis—is a complaint presenting so many varieties and individual peculiarities, that it is impossible to speak of it with anything like certainty. Some patients never suffer from asthma while at sea, whereas others have their most severe attacks on board ship. The only reliable guide will be the patient's own previous experiences. If he has found, for instance, that he is most free from asthmatic attacks when staying at the seaside, he may generally safely look forward to deriving benefit from a voyage; but if an inland climate or the smoke-laden atmosphere of cities suits him best, he should on no account attempt to go to sea, as it is probable that the pure and somewhat humid air of the ocean would only aggravate his sufferings.

Inflammation of the lungs (pneumonia) and *pleurisy* are diseases which sometimes leave behind them after-effects of a very serious character: the lungs may be crippled in various ways, or weakened and rendered extremely susceptible to climatic influences, while the general health may be also more or less affected. In these cases—especially if the patient is young and the constitution naturally a sound one—it is impossible to speak too highly of a sea voyage as a means of insuring complete convalescence. The unfailing supply of fresh air, the enforced rest, the voracious appetite that usually sets in, have the happiest effect, and the patient often returns home with a re-established constitution.

Nervous complaints.—These are so numerous and so

varied in their manifestations that it is only possible to speak of them generally. It may, however, be stated broadly that for all those anomalous affections of the nervous system that are not accompanied by any actual disease of the brain or spinal cord, but which are often dependent either upon mental causes or derangement of the digestive organs, we have in a sea voyage a most valuable and successful mode of treatment. In fact, there are no cases in which, as a rule, the effects of sea life are more strikingly beneficial than in these. The change of scene, the different mode of life, and the varied social conditions, usually exercise the most cheering influence, not only upon the bodily health, but also (which is equally important in complaints of this class) upon the mental state; so that the nervous patient, after a month or two at sea, is often altogether a different being from what he was when he sailed.

With regard to the more serious diseases of the nervous system, such as paralysis and epilepsy, it is necessary to speak much more guardedly; and it is only after all the circumstances of such a case have been carefully weighed by the medical men in attendance, that it will be possible to form a decided opinion as to the advisability of a sea voyage.

Scrofulous affections of joints and all kindred affections may, in certain stages, be most successfully treated by means of a sea voyage. It would of course be inadvisable to send a patient to sea while suffering from the more acute forms of joint disease, as the constant surgical attention and the many appliances and comforts required by the sufferer could scarcely be obtained on board ship. But when the more active symptoms have subsided, and, as is so often the case, the disease assumes a chronic form, the slow and tedious convalescence may, in suitable cases, be wonderfully hastened by a sea voyage of some duration.

On land, fresh air and change of locality can, as a rule, only be obtained at the expense of jolting in a carriage or some other equally objectionable mode of conveyance; whereas at sea the patient can, during the greater portion of the voyage, recline on deck in an invalid chair, under the most health-giving conditions of climate, and surrounded by much that will serve to interest and amuse him.

Debility, though not in itself a distinct disease, is nevertheless a very definite condition. It may be brought about from a variety of causes. The professional man, or man of business who has broken down through over-work, —the patient who is recovering from a severe illness or the effects of a surgical operation, and whose convalescence is slow and tedious,—the lad who has "outgrown his strength," —these are a few instances out of many that could be given of the way in which a constitution may become enfeebled, and where, although no actual disease may exist at the time, a thorough change of scene and climate becomes necessary to restore strength or prevent the development of more serious complaints. For cases such as these a sea voyage is thoroughly suitable: the entire rest, the invigorating sea climate, and the fresh experiences of life on board ship, are just what are required to build up a weakened and debilitated system.

There are doubtless many other cases, besides those that have been mentioned, which the physician will from time to time see fit to send to sea; but the foregoing will be found to include most of the disorders from which the great majority of invalids met with on board ship are found to be suffering. In by far the greater number of such cases the patient will improve during the voyage; and, in fact, *properly selected* cases will seldom fail to do so.

But the improvement in health will not be confined only

to actual invalids. Those who are travelling for business or pleasure will almost always derive marked benefit from the voyage, and if they are strictly careful in following out the rules as to diet and exercise that are given in the following pages, they will generally experience an astonishing increase in strength and vigour by the end of the passage.

At the same time, those who take a voyage, whether as invalids or otherwise, must not fall into the mistake of looking upon the sea as a panacea for every ill, but must make up their minds to face many inconveniences and perhaps even a few dangers in their ocean life.

CHAPTER II.

THE VARIOUS HEALTH VOYAGES.

Choice of voyages limited—The voyage to the West Indies—The voyage to Brazil and the River Plate—The climate of Brazil—The voyage to the Cape of Good Hope—The voyage to India by the Suez Canal—The voyage to Australia: three routes—The Indian route—the Pacific route—The Atlantic route—The latter voyage most suitable for invalids.

WE will now suppose that the reader, if an invalid, is under sailing-orders from his physician; that he has been recommended to take a sea voyage for the benefit of his health, but that he has not yet received any definite instructions as to his route and destination. The world lies before him, and at first sight there would seem to be routes innumerable from which to choose. But practically the choice will be found to be much more limited than might be supposed. For the over-worked man, indeed, or for the nervous invalid to whom change of thought and scene are of more importance than climatic influences, there will be a tolerably wide field for selection; but in the case of those who are suffering from physical ailments, especially such ailments as affect the respiratory organs, the really suitable voyages are reduced to a very small number.

Excluding all sea passages of less than, say, fourteen days each way, as not affording sufficient time for the ocean climate to exercise an appreciable influence on the

health and constitution, there remain the following voyages which may be considered more or less suitable :—

To The West Indies.
" Brazil and River Plate.
" The Cape of Good Hope.
" India, China, etc., by the Suez Canal.
" Australia, etc., by the Suez Canal.
" " by the Pacific routes.
" " by the Cape of Good Hope.

Let us examine in turn the advantages and disadvantages for invalids of each of the above-named voyages.

THE VOYAGE TO THE WEST INDIES.—This voyage is specially suited for those who have but little time at their disposal, as the passage is a comparatively short one. It has also the additional advantage of being made in some of the finest and best-found steam-vessels afloat, with every surrounding of comfort and luxury that is possible at sea; while the scenes visited at the various islands present a constant succession of objects of interest to the traveller and naturalist. The charming description of these beautiful islands of the Atlantic given in Charles Kingsley's "At Last," will have rendered their wonders familiar to many readers.

The voyage to the West Indies should only be undertaken in winter, as in summer the climate is far from desirable for Europeans, but during the cooler months of the year—November, December, January and February—most of the islands may be visited with confidence.

The steamers of the Royal Mail Steam-Packet Company leave Southampton for the West Indies on the 2nd and 17th of each month. The steamer that sails on the 2nd goes direct to St. Thomas; that which starts on the 17th calls first at the Island of Barbadoes. Both packets afterwards proceed to Jamaica, calling at various islands on their way. The voyage across the Atlantic from South-

ampton to either St. Thomas or Barbadoes occupies, on an average, about fourteen days, and the trip may afterwards be indefinitely prolonged by proceeding in the Company's steamers to the various groups of islands, or to the adjacent ports of Mexico, Central America, or British Guiana. The Company have arranged various tours, occupying from six weeks to four months, and these afford opportunities for visiting an almost endless variety of places of interest.

The following is a list of the various islands and ports at which the steamers call :—

Island of St. Thomas.

Island of Porto Rico.
- City of San Juan.
- Naguabo.
- Arroyo.
- Ponce.
- Mayaquez.
- Aguadilla.

Island of San Domingo.
- Porto Plata.
- Samaná.
- San Domingo.
- Jacmel
- Port-au-Prince

Windward Islands, etc.
- St. Kitts.
- Antigua.
- Guadaloupe.
- Dominica.
- Martinique.
- St. Lucia.
- Barbadoes.
- St. Vincent.
- Grenada.
- Trinidad.
- Tobago.

Island of Jamaica—Kingston.
Island of Cuba—Havana.
Island of Curacoa.

PORTS OF CENTRAL AMERICA, etc.	Vera Cruz—*Mexico.*
	Belize—*Honduras.*
	Grey Town—*Nicaragua.*
	Port Simon—*Costa Rica.*
	Colon—*Isthmus of Panama.*
	Carthagena, Savanilla } *New Granada.*
	La Guayra—*Venezuela.*
	Demerara—*British Guiana.*

With the exception of St. Thomas, which is seldom free from fever, and at which it is not advisable for Europeans to land, most of the islands may be visited in winter without risk, and the climate, although somewhat relaxing, is pleasant and enjoyable, and will form a most agreeable contrast to the rigours of an English winter; while the constant change of scene and the ever-varying interest render this voyage an admirable one for the over-worked professional man or the nervous invalid.

For those, however, who are suffering from physical illness, especially if it have a pulmonary origin, the voyage to the West Indies is not so suitable. The time occupied in crossing the Atlantic each way is not sufficiently long to allow of the sea climate exerting its full curative influence; and the climate of the islands themselves is not sufficiently good to constitute a really desirable health-resort for consumptives. The fatigue also of landing and embarkation at the various ports would be trying for a confirmed invalid.

THE VOYAGE TO THE PORTS OF BRAZIL AND THE RIVER PLATE has, for invalids, considerable advantages over that to the West Indies. The time occupied in the passage to the various ports is approximately as follows:—

To Pernambuco	17 days.	To Santos	25 days.
,, Bahia	19 ,,	,, Monte Video	26 ,,
,, Rio de Janeiro	22 ,,	,, Buenos Ayres	27 ,,

The passenger, therefore, who chooses for his destination the most distant of these ports will have been at sea nearly four weeks; and although a considerable portion of the route lies near land, the greater part of the coasting is done in latitudes that are favourable to the invalid. Another point in favour of the voyage is that, while it has the advantage of being longer than that to the West Indies, it can be made under circumstances of equal comfort, as not only do the Royal Mail Company run steamers to Brazil and the River Plate, but there are also several other important lines of steam-vessels sailing from various ports. Amongst these may be mentioned the Pacific Steam Navigation Company, the Red Cross line, and the Liverpool and Brazil Mail line, from Liverpool; the Belgian Royal Mail line, from London; and the Messageries Maritimes French Mail steamers, from Bordeaux.

The steamers of the Royal Mail Company leave Southampton for Brazil on the 9th, 24th, and 27th of each month.

The packet which sails on the 9th calls at the following places: Cherbourg, Lisbon, St. Vincent (Cape Verd Islands), Pernambuco, Bahia, Rio de Janeiro, Santos.

The packet that sails on the 24th calls at Lisbon, Pernambuco, Maceio, Bahia, Rio de Janeiro, and Santos.

The steamer that sails on the 27th calls at Cherbourg, Carril, and Vigo, and then proceeds direct to Monte Video and Buenos Ayres.

As regards the attractions presented by this voyage, I cannot do better than quote the following passage from Kidder and Fletcher's "Brazil and the Brazilians," which, although it refers to the homeward voyage, and mentions one or two places not now called at, will, *mutatis mutandis*, apply equally well to the outward passage: "I have sailed on many seas, but I know of no voyage which, all things considered, is comparable to that from Rio de Janeiro to

England. We are out of sight of land but six days at the longest stretch, from Pernambuco to the Cape de Verds; while the average number of days at sea without stopping are two and a half. From Rio to Bahia there are but three days' steaming over summer waters, and the ten or twelve hours at the second city of the empire gives plenty of time for refreshing promenades or rides into the country. In less than two days we land at Pernambuco, where we spend from twelve to twenty hours, lay in a stock of fine oranges and pineapples—capital "nauseatics"—and perhaps purchase a few screaming parrots or chattering monkeys to present to our European friends. We then steam for St. Vincent, Cape de Verds, where we remain a few hours; and next, steering northwards, in forty-eight hours we behold, 150 miles at sea, the tall Peak of Teneriffe, lifting itself more than 13,000 feet from the bosom of the ocean. Here we revel in peaches, pears, figs, and luscious clusters of grapes—in short, all the fruits of the temperate zone. We pass through the Canaries, and in thirty hours are at Funchal, where the fruit-dose is repeated. A walk upon the shore, 'if health bill clean,' is permitted, and, after being bored a few hours by the pedlars and grape-vendors, we bid farewell to picturesque Madeira, and at the end of three days sail up the mouth of the Tagus and anchor before Lisbon. When we leave Portugal we steam along its coast and that of Spain, and in three days we land at Southampton. No such steamer voyage exists in the world; and those who are in quest of the strange, the new and the beautiful, can nowhere so easily and so cheaply gratify their wishes in those respects as by the trip from Southampton to Rio, or *vice versâ*."

The climate of Brazil is on the whole a favourable one for Europeans, especially during the cooler months of the year. The northern portions of the state are of course tropical; but Rio de Janeiro, the capital, is situated only

just within the tropics. Buenos Ayres and Monte Video, the cities of the River Plate, being situated many degrees further south, possesses a much cooler climate.

The same authority I have quoted above gives the following account of the climate of Brazil:—

"No other tropic country is so generally elevated as Brazil. Though there are no very lofty mountains except on its extreme western border, yet the whole empire has an average elevation of more than 700 feet above sea-level. This great elevation and those strong trade-winds combine to produce a climate much cooler and more healthful than the corresponding latitudes of Africa and Southern Asia. The traveller, the naturalist, the merchant, and the missionary, do not have their first months of pleasure and usefulness thrown away, or their constitutions impaired by acclimatising fevers. The mean temperature of Brazil, which extends from nearly the fifth degree of north latitude to the thirty-third degree of south latitude (almost an intertropical region), is from 81° to 88° F., according to different seasons of the year. At Rio de Janeiro, on the authority of Dr. Dundas, the mean temperature of thirty years was 73°. In December (which corresponds to June in the northern hemisphere) maximum 89·5°, minimum 70°, mean 79°. In July (the coldest month) maximum 79°, minimum 66°, mean 73·5°. I can add, from my own observations for several years, that I never saw 90° attained in the summer-time, and the lowest in the winter (June, July, and August) was 60°, and this was early in the morning. It must, however, be conceded that three months of weather ranging between 73° and 89° would be intolerable if it were not for the cool sea-breeze on the coast, which generally sets in at eleven a.m., and the delicious land-breeze, which so gently fans the earth until the morning sun has flashed over the mountains. In the interior the nights are always cool, and it may be added

that 100 miles from the sea-coast the climate is entirely different. Rio is happily situated in its accessibility to the elevated regions. An hour's ride leaves you among the cascades and coolness of Zijuca. Six hours by steamer, railway and coach, lift you up to the mountain-city of Petropolis; or twelve hours will bring you amid the sublimities of the Sierra dos Orgöes and the silent and refreshing shade of Constancia, where at Heath's we may be far away from the dust, din and diplomacy, that are the constant concomitants of the commercial and political capital of Brazil." *

Lest the somewhat glowing description just quoted should convey a false impression as to the healthfulness of the climate, it is but right to add that of late years yellow fever has invaded the coast of Brazil, and that now nearly all the ports are subject to its visitations. Except, however, during an epidemic, the cases are not numerous, and I am assured that a casual visitor is not likely to run any risk from this cause.

Perhaps the best of the Brazilian ports for the invalid to stay at, if he contemplates remaining any length of time, will be Rio de Janeiro; for though the city itself is unhealthy, the high-lying localities mentioned above possess a fine and salubrious climate. It will, however, be still better to push on to the River Plate, and to take up quarters either at Monte Video or Buenos Ayres, both of these cities being almost entirely free from fever, and possessing a cooler climate than any of the Brazilian ports. Both Monte Video and Buenos Ayres are lively and interesting cities, and a stay of some duration may be very agreeably made at either of them.

THE VOYAGE TO THE CAPE OF GOOD HOPE.—This voyage, although scarcely so interesting to the general traveller as

* "Brazil and the Brazilians," Kidder and Fletcher.

either of the preceding, is, for invalids, perhaps the best of all the shorter voyages. A great part of the course lies through the central regions of the Atlantic, far removed from land influences ; and the time occupied in the passage out and home is sufficient to allow the ocean-climate to exert, to some extent, its specific effect on the constitution. In addition to this, the climate of South Africa is one of the best for pulmonary complaints that is to be found in the world.

There are two good lines of passenger steamers between England and the Cape—viz., those of the Union Steamship Company and those of the Colonial Mail line (Messrs. Donald, Currie, and Co.).

The Union Company's steamers for the Cape of Good Hope leave Southampton every alternate Thursday, calling at Plymouth the following day. In addition to these, a steamer for Port Elizabeth and Natal direct is despatched every fourth Thursday.

The Colonial Mail steamers sail from London for Cape Town every alternate Tuesday, calling at Dartmouth on the following Friday.

The Union Company's fortnightly steamers for Cape Town call at Madeira; but the direct Port Elizabeth steamer calls at St. Vincent (Cape Verds) instead. Once in eight weeks one of the steamers calls at St. Helena. Ascension is only touched at on the homeward voyage.

Messrs. Donald Currie's steamers call at Madeira, and at stated intervals they also touch at St. Helena and Ascension.

The accommodation on board both these lines of steamers is very good, and will compare favourably with that of the other important ocean lines.

The average length of passage from Southampton to Cape Town is now about twenty-three days ; to Port Elizabeth twenty-five days, and to Natal twenty-eight days.

Those who do not mind roughing it may sometimes meet with a sailing vessel, bound for the Cape, that has tolerable accommodation for a passenger or two ; but any one going in this way must be content to put up with sea fare ; and the society on board will probably be limited to that of the captain and his officers.

The voyage by a sailing vessel will take from six to eight weeks—sometimes even longer—and although this extended time at sea is in some respects very desirable for an invalid, yet the advantages of a sailing vessel over a steamer (which will be fully considered in a future chapter) will be in this case to a certain extent counter-balanced by the want of society and the absence of table comforts.

A passage of this kind should only be taken under the advice of some one who thoroughly understands such matters, and who can give a reliable opinion as to the seaworthiness of the ship. The cost of a passage by a sailing vessel is considerably less than by a steamer.

The voyage to the Cape of Good Hope may be extended by taking the local steamers to Algoa Bay or Natal. An account of the climate of South Africa and the localities most suitable for invalids will be found in another chapter.

THE VOYAGE TO INDIA, CHINA, ETC., BY THE MEDITERRANEAN AND THE SUEZ CANAL.—This voyage, from numberless descriptions, is familiar to every one as being the great high road to our Eastern possessions. It has the advantage of affording glimpses of many countries in the quick succession of a moving panorama ; while the competition of many great lines of steamers renders the passage rapid and luxurious. In other respects, however, it can scarcely be regarded as a health-voyage. The climate of the Mediterranean—whatever that of its coast line may be—is not considered favourable for chest diseases ; and the intense

heat usually experienced in the Red Sea is trying to every constitution.

The Peninsular and Oriental Company's steamers sail from Southampton every Thursday for Bombay, etc., *viâ* the Suez Canal. On alternate Thursdays passengers have to change steamers at Suez, but at other times the whole voyage to Bombay is performed without transhipment.

In the "overland route," which is the quickest, passengers cross the Continent of Europe by railway to Venice or Brindisi; from thence they are conveyed by steamer to Alexandria, and instead of sailing through the Suez Canal they make the journey across the Isthmus by train, re-embarking at Suez for Bombay, etc., in one of the Company's steamers.

Besides the vessels of the Peninsular and Oriental Company, many other fine lines of steamers ply to India, China, and Japan through the Suez Canal from various British and Continental ports. The accommodation and cuisine provided by most of these lines is excellent, and leaves little to be desired.

The ports touched at by the Peninsular and Oriental steamers between Southampton and Bombay are Gibraltar, Malta, Port Said, Suez, and Aden.

The steamers for Calcutta, after leaving Aden, proceed direct to Point de Galle (Ceylon), calling afterwards at Madras; those for China and Japan sail from Aden to Point de Galle, from thence to Penang, and passing through the Straits of Malacca, touch at Singapore, and afterwards sail northwards to Hong Kong, Shanghai, Yokohama, etc.

The time occupied in the voyage from Southampton to the various ports of the Mediterranean, India, etc., is approximately as follows:—

From Southampton	to	Gibraltar	5 days.
,,	,,	Malta	9 ,,
,,	,,	Port Said	13 ,,

From Southampton	to	Suez.	14 days.
,,	,,	Aden	15 ,,
,,	,,	Bombay	27 ,,
,,	,,	Ceylon (Point de Galle)	29 ,,
,,	,,	Madras	33 ,,
,,	,,	Calcutta	37 ,,
,,	,,	Penang	37 ,,
,,	,,	Singapore.	39 ,,
,,	,,	Hong Kong	48 ,,
,,	,,	Shanghai.	54 ,,
,,	,,	Yokohama (Japan)	57 ,,

As neither the passage itself to India and China by steamer, nor the climate of those countries, can be recommended for confirmed invalids, this voyage may be dismissed for the present, but it will be necessary to revert to it when speaking of the various Australian routes.

The days of the fine old East Indian sailing vessels, which used to convey passengers, troops and freight to our Eastern possessions by way of the Cape of Good Hope, have passed away. The whole of the passenger traffic is now diverted to the Suez Canal, and even cargo is for the most part conveyed by that route; but a few sailing vessels still carry freight by the old route, and it would occasionally be possible for those so disposed to secure a passage on board one of those ships; but as they are neither fitted up nor victualled with a view to carrying passengers, the accommodation will necessarily be rough, and the absence of society and the tediousness of the voyage would deter most people, nowadays, from taking what was formerly one of the favourite and most luxurious of health voyages.

The Voyage to Australia and New Zealand.—This is the voyage which, in preference to all others, is now usually recommended to invalids—especially to those who are suffering from pulmonary complaints. Its length allows time

for the ocean climate to exert its full effect upon the constitution; the destination is a healthy one; and the choice of steamers, "auxiliary screw" vessels, and sailing ships is almost unlimited.

There are now three great routes to Australia—viz., the Indian route, the Pacific route, and the Atlantic route.

(1.) *The Indian Route.*—The Peninsular and Oriental Company convey passengers for Australia by way of the Mediterranean, the Suez Canal and the Red Sea to Point de Galle, and from thence by another steamer to King George's Sound, Adelaide, Melbourne and Sydney. The passage from Southampton to Melbourne by this route occupies about fifty-three days; it can, however, be shortened to the extent of two or three days by travelling "overland" to Venice or Brindisi, or it can be lengthened indefinitely by taking Indian or other ports on the way. Passengers may, if they prefer it, travel to Queensland by way of Singapore and Torres Straits. In this case they are conveyed on from Singapore by the steamers of the Eastern and Australian Mail Steam Company.

The high qualities of the Peninsular and Oriental Company's steamers are too well known to need comment, and the many comforts, the varied society and amusing incidents of this route will always recommend it as a pleasure trip. The disadvantages for invalids of the first part of the passage have been already pointed out, but after Aden has been passed and the Red Sea left behind, the healthfulness of the voyage is much increased, although even now a great part of the course will lie through those equatorial regions which, of all parts of the ocean, are least desirable.

(2.) *The Pacific Route.*—This voyage may be made either by way of New York and San Francisco, or by the Isthmus of Panama.

In the former case the passenger may travel by any of the great Atlantic lines of steamers to New York, from whence a railway journey of over 3,300 miles across the whole breadth of the American continent takes him to San Francisco, where he joins one of the Pacific Mail steamers for Sydney, calling at Honolulu (Sandwich Islands) and Auckland (New Zealand) on the way.

The distances and the average time occupied on this route are as follows :*—

	Miles.	Days.
Liverpool to New York	3,000 . .	10
New York to San Francisco . . .	3,318 . .	6
San Francisco to Honolulu	2,100 . .	8
Honolulu to Auckland	3,879 . .	15
Auckland to Sydney	1,300 . .	4
Total	13,597 . .	43

The first half of the railway journey from New York across the American continent can be varied to a considerable extent, according to individual taste, and can be made to embrace a great number of places of interest. The latter section of the journey is made by the Pacific Railway, and takes the traveller near some of the most magnificent scenery and most remarkable localities of the New World.

If, in order to avoid the long railway journey across America, the voyage is made by way of the Isthmus of Panama, the traveller can either proceed in the first instance to New York as before, and from thence take one of the Pacific Mail steamers to Aspinwall; or, preferably, he can sail direct to the latter place from England by one of the Royal Mail steamers.

Colon (Aspinwall), on the northern or Atlantic side of the Isthmus, is connected with Panama, on the southern or

* Handbook of Pacific Mail Steamship Company.

Pacific side, by a railway line forty-seven miles in length. From Panama the Pacific Mail steamers convey passengers to San Francisco, where they are transferred to another of the Company's vessels for Sydney, *viâ* Honolulu and New Zealand.

Although both the Pacific routes are full of interest to the general traveller, neither of them can be regarded as suitable to the confirmed invalid. The long railway journey in the one case, occupying, as it does, many days and nights; the unhealthy climate of the Isthmus of Panama in the other case; the many changes and the relaxing latitudes common to both, render the Pacific routes inadmissible for the valetudinarian. At the same time it must be acknowledged that, for those who are sufficiently well to brave fatigue and heat, and whose first considerations are change and recreation rather than the curative effects of the ocean climate, there are few pleasanter ways of seeing the world than by combining the Pacific and the Indian routes—visiting Australia, for instance, by way of New York and San Francisco, and returning by way of India and the Suez Canal, or *vice versâ*. The Pacific Mail Steamship Company issue circular tickets for this tour round the world, and give every facility for breaking the journey at all points of interest which the tourist may desire to visit.

(3.) *The Atlantic Route.*—As the long sea voyage to Australia round the Cape of Good Hope is emphatically the invalid's route, it demands more careful consideration than either of the preceding. Although, perhaps, presenting less variety and interest than the others, its advantages for the invalid are at once apparent. The whole voyage is performed without transhipment or changes of any kind, so that the traveller can settle himself into his cabin, surrounded by such comforts as are possible to him, and feel that it will be his floating home until he is landed at his

destination on the other side of the world. The duration of the voyage—from forty days to three months, according to the class of vessel in which it is made—is sufficiently long to allow the sea climate to exert its full constitutional effects; and, lastly, the portions of the ocean that are traversed by this route are, on the whole, the best that can be chosen. The voyage itself and the regions of the ocean through which a vessel passes on its way to Australia by this route, are described in detail in other chapters; at present it will be only necessary to glance at the different classes of passenger ships available for selection by the intending voyager.

There are three descriptions of vessels from which to choose: viz.,—(1) Full-powered ocean steamers, (2) sailing vessels, (3) a combination of the two—viz., sailing vessels with an "auxiliary screw."

With the exception of the venerable *Great Britain*, which plied for so many years between England and Australia without a rival, and which properly belonged to the class of auxiliary screws, Australian steam vessels are a comparatively recent institution.

About 1862 Messrs. Money Wigram added to their fine fleet of Australian sailing ships a few vessels such as the *Somersetshire*, the *Northumberland*, and the *Durham*, which, while they are built to sail with speed, are also furnished with screw propellers, worked by engines of moderate power, for use when the wind is light or contrary.

Vessels of this class make the passage to Melbourne under favourable circumstances in from fifty to fifty-five days. Some of the newer ones have occasionally done it in forty-five days.

The first steam vessel built to perform the *whole* journey between England and Australia by steam, without the aid of sails, was despatched in 1874, and despite all unfavour-

able prognostications, succeeded in making the voyage to Melbourne in about forty-nine days, including stoppage at the Cape to coal. Since that time many other full-powered steamships have been put on to the Australian line, the average time occupied on the passage being now only from forty to forty-five days.*

The lines of sailing vessels to Australia and New Zealand are now so numerous as to afford passengers an almost unlimited choice; and although some of the old well-known firms, such as Green's and Wigram's, still retain the foremost rank in public estimation, yet the competition is so great that fairly good accommodation may be reckoned upon in the ships belonging to all respectable owners, if due care is taken in the selection, while the charges by some of these are considerably lower than in the case of the old-established lines.

The speed of sailing vessels has been greatly increased since the days when a voyage to Australia often occupied six months. It may now take from fifty-nine days (which is, I believe, the shortest passage on record) to 120 days, or, in *very* exceptional cases, even longer; while the average length of passage is about eighty days.

More detailed information as to the various lines of passenger ships to Australia, and the comparative merits of the different classes of vessels, will be found in the next chapter.

* The *Orient* has, I believe, made the passage in thirty-seven days.

CHAPTER III.

TIME OF STARTING.—CHOOSING A SHIP.

Best time of starting for the West Indies—Healthiest months in India—Reversal of the seasons in the southern hemisphere—The best time of year for Brazil and the Cape of Good Hope—Importance of leaving England in the early autumn—Choice of a ship—Respective advantages of sailing vessels and steamers—Tonnage of sailing vessels—Iron, wooden, and "composite" ships—Poop-ships and flush-deck ships—Australian steam-lines—The "Orient" line—The "Colonial" line—The "Elder" line—Messrs. Wigram's steamships—Australian lines of sailing vessels: Messrs. Green's "Blackwall" line—Messrs. Wigram's sailing ships—Messrs. Devitt and Moore—Messrs. Anderson, Anderson, and Co.—Messrs. Trinder, Anderson, and Co.—Messrs. Houlder Brothers and Co.—Mr. J. H. Flint—Various other firms—New Zealand lines—The New Zealand Shipping Co.—The "Passenger" line—The Australian ports.

HAVING selected his route, our traveller must next decide upon his time for starting. Of course in many cases he will have no option—he must go when he can; but where circumstances will allow a choice to be made, the time of year at which the voyage is commenced is a point to be carefully considered, not only with reference to the voyage itself, but also with regard to the climate of the country that is to be visited. Thus, hot countries should, as a rule, be visited only in winter; and even in those countries which possess a more moderate climate, some months are much more favourable than others. A brief consideration of the best time of year for making each of the voyages that have been mentioned may prove useful.

In the West Indies the seasons coincide with our own;

and it is only in winter that a European, and especially an invalid, would from choice visit these islands. One or two of the West Indian ports are scarcely altogether free from yellow fever and other infectious diseases even in winter, and, of course, in summer the risk of infection is everywhere greater; added to which, the intense heat during the hot months of the year would be trying even to the strongest constitutions. The best time, therefore, to start on this voyage is in the late autumn, so as to be in the West Indies during the months of December, January, or February. The necessity for starting so late in the year is a drawback to this voyage for those suffering from any chest delicacy.

In taking a voyage to India through the Suez Canal the time of starting is also very important. During the summer and early autumn the heat in the Red Sea is often most intense,—so much so as occasionally to prove fatal; while the pleasantest and healthiest months for Europeans in India are as a rule November, December, and January. The time of sailing should therefore be so arranged as not only to avoid as much as possible the period of extreme heat in the Red Sea, but also to arrive in India during the cool season. This is best done by leaving England some time during the month of October.

The seasons in countries situated in the southern hemisphere are of course the reverse of our own, and the time of departure must be arranged with due regard to this fact. The following simple table of the months which correspond with each other in the two hemispheres may be found of use:—

January	corresponds	with	July
February	,,	,,	August
March	,,	,,	September
April	,,	,,	October
May	,,	,,	November
June	,,	,,	December.

In Brazil the healthiest season of the year, on the whole, is the winter (corresponding to our summer)—the coolest month being July. An invalid visiting that country should therefore endeavour to start in the spring, about May. Unless it is intended to spend the following winter abroad, the Brazilian voyage is on this account an unsuitable one for patients suffering from pulmonary complaints, as they would be returning to England at the worst time of year—viz., in the autumn.

The climate of the Cape of Good Hope, if the locality be judiciously chosen, is at all times a good one for chest-invalids; but the time of year when the country is to be seen at its best, and when the colony is altogether pleasantest for Europeans, is the spring—viz., about October and November. The best time, therefore, for leaving England will be in September, which is an admirable time for invalids who wish to escape the winter at home.

In the Australian colonies, as in South Africa, localities are to be found that are admirably adapted for invalids at all seasons of the year. Those, therefore, who choose the Australian voyage need be under no particular anxiety as to the time at which they will arrive at their destination. Speaking generally, the autumn—corresponding to our March, April, and May—is perhaps the most favourable time of year as regards climate. In many parts of Australia, however, the winter is delightful, while for seeing the vegetation in full perfection the spring is the most favourable time.

The climate of Australia and of South Africa, and the characteristics of the seasons in those countries, will be fully described in future chapters.

Having spoken of the best time for sailing as regards the climate of the country to be visited, it may be as

well to say a few words as to the most favourable months for leaving our own shores in order to avoid the inclemencies of our climate and unnecessary discomforts at starting.

For invalids suffering from chest delicacy it will of course be very important to escape our English winter; and for this reason the autumn should in all cases be chosen, when practicable, as the time for commencing the voyage. It is true that cold weather will not altogether be avoided by those who start in the autumn on a voyage to Australia. For five or six weeks after passing to the south of the Cape of Good Hope a temperature will be experienced which, though seldom below 50°, will appear considerably lower on account of the humidity of the air and the strong winds that almost constantly blow in those regions of the ocean. But although the weather is cold and bracing, it is still the summer of those latitudes, as shown by the length of the days and the brightness of the sunshine. Those few weeks of cold weather are therefore very different in their effect on the constitution to the seven or eight months of fog, gloom, and rain which we so frequently experience in England.

The date of sailing should not be delayed too long. September, or, at the latest, October, should be the month chosen. Towards the end of September and the beginning of October the "equinoctial gales" are supposed to prevail round the British coasts, and some may prefer to avoid sailing during the time they are expected. But seafaring men take but little notice of these gales, which are very irregular in their occurrence.

The invalid should, if possible, avoid sailing during the winter months. The weather round our coasts is then often very severe, and the cold is all the more trying because the comforts of home have just been left behind. Sea fogs and violent gales frequently prevail during the

winter season, and increase the discomforts, if not the dangers, of the first part of the voyage.

Besides these objections to commencing a voyage in winter, there is also the very important one of the rapid transition from the cold of England to the heat of the tropics, which cannot but be trying to those of delicate constitution at the commencement of a voyage.

From the foregoing remarks it will be seen that if the invalid is in a position to fix his own time of starting; if his destination should be the Cape of Good Hope or Australia; and particularly if he suffers from chest delicacy, the early autumn is the best time for him to commence his travels.

CHOICE OF A SHIP.—The next point will be the choice of a ship. If the voyage is to the West Indies, to Brazil, to India by the Suez Canal, or to the Cape of Good Hope,* the choice will be confined to those steamers of one or more great lines which happen to be sailing at the time the traveller wishes to start. Nor would it be necessary in these cases to exercise any further selection, because the name of the company is usually a sufficient guarantee for the safety and comfort of each of its vessels. But when the contemplated voyage is to Australia or New Zealand by the Atlantic route, there will be a much wider choice. It will then be necessary to decide between sailing vessels, steamers, and vessels with an auxiliary screw; and, if a sailing vessel be chosen, there will be the ships of various lines from which to select.

This brings us to the important question of the respective advantages to the invalid of sailing vessels and steamers. Putting aside the question of greater speed and economy of time, which, it is to be supposed, are not of the first importance to an invalid traveller, the principal advantages

* Unless this voyage is made in a sailing vessel.

of a steamer over a sailing vessel are the (usually) superior cuisine and attendance, and the uniform rate of progress—the steam-power being specially of value as ensuring a rapid passage through those equatorial regions in which it is by no means desirable to linger. The currents of air produced by the movement of the vessel, and the greater facilities for ventilation by means of windsails, etc., will also be points in favour of steamers during the warmer parts of the voyage. Against these advantages, however, are to be set some very grave drawbacks. One of these is the constant vibration of the engines, which, continuing night and day, is very distressing to some invalids, especially those who are suffering from nervous complaints. The disagreeable smell and heat from the engine-room, and the blacks which are sometimes sprinkled from the funnel, are also far from pleasant. But added to these are the still more important disadvantages of smaller and more crowded cabins, and (in some steamers) of less space available for exercise on deck.

Vessels with an "auxiliary screw" would seem at first sight to combine all the advantages of sailing ships and steamers; and in some respects this is the case. They sail when the wind is favourable, and they have the advantage of being able to get up steam and hurry through those belts of calm in which a vessel with only sails to depend upon is sometimes detained for many days. The great objection of comparatively small and crowded cabins still, however, remains, and seems at present to be inseparable from steamers of all kinds, whose greater expenses render it necessary to economise space and to carry proportionately a larger number of passengers than sailing vessels.

Looking at the question from every point of view, there can be no hesitation in saying, that, for any one really travelling for health, a sailing vessel is more suitable than a steamer, especially if the invalid suffers from chest

delicacy. Not only are the cabins more roomy and less crowded, but a certain air of quiet and an absence of bustle and hurry usually prevail on board a sailing vessel, which are seldom to be found in a steamer ; and although those who are of an impatient disposition may chafe at the delay caused by calms and contrary winds, others only regard those hindrances as an agreeable change, and find them less monotonous than a uniform rate of progress.

But the most important points of all in favour of a sailing vessel for invalids suffering from chest delicacy are the greater length of time occupied in the voyage,—thus allowing the climate of the sea ample scope for its curative effects,—and the more gradual transition from cold to hot latitudes, and *vice versâ*. In a steamer these transitions are so sudden and abrupt as often to be extremely trying to delicate constitutions; for although those changes of climate, by their hardening effect on the system, constitute an important factor in the benefit derived from sea voyages, yet if made too rapidly the shock is greater than can be borne by most invalids.

Australian sailing vessels intended to carry passengers are generally of from 1000 to 2000 tons register. As a rule, the larger the ship the steadier she will be in all ordinary weather ; but some seafaring men hold that in really severe gales a ship of 1000 tons will behave better than one of 2000. Speaking generally, and from personal experience, I am inclined to the opinion that the larger the ship the more comfortable she will be found in all respects, under all ordinary circumstances.

Iron has been so rapidly superseding wood for ship-building purposes of late years, that the old-fashioned "frigate-built" ship, framed entirely of hard wood (generally teak or oak), is quickly disappearing. The new ships are mostly either built altogether of iron, or are what are called "composite" ships—that is, they consist of a casing

of wood upon an iron framework. There are still, however, some fine wooden ships remaining; and, where the choice can be made, wood is to be preferred to iron for several reasons, the most important of which is that wooden ships are cooler in hot and warmer in cold latitudes than iron ones. Composite vessels, however, whose sides are constructed entirely of wood, are free from any objection, and are often most comfortable and reliable in every respect.

The great majority of passenger sailing vessels are "poop ships," and most of the first-class passengers are accommodated in the poop-cabins.* There are, however, a few very fine "flush-deck" ships, in which there is either no poop at all, or one only sufficiently large to contain the officers' cabins. In these vessels the whole of the passengers' cabins are on the lower deck. Flush-deck ships have one or two advantages over those with a poop. They generally afford a larger space for exercise, and the cabins are more protected in rough weather.† On the other hand, the ventilation in the cabins is not usually so good as it is in a poop ship, as the ports are not only smaller, but also being nearer the sea, they have to be closed more frequently. In fact, poop-cabins are always liked on account of their airiness and cheerfulness.

Having thus weighed the respective advantages of steamers, vessels with an auxiliary screw, and sailing vessels, the reader will be in a position to make his selection of the class of ship which will best suit his requirements and the length of time at his disposal.

* The poop is built above the level of the main deck, and contains the saloon and the best sleeping-cabins.

† Flush-deck ships frequently have a smoking-room on deck. This is a very great advantage to invalids, as it affords them shelter during rough or rainy weather, and they are not compelled to go below and breathe the vitiated air of the saloon and cabin—always worse at such times on account of the skylights being closed.

If it is decided to make the passage out by steam the choice will be somewhat limited, as there are at present only two or three lines of steamers running to Australia. They are as follows: but changes are so constantly occurring in all matters connected with shipping that the information given can only be taken as approximately correct up to the date of publication :—

1. The full-powered steamships of the "Orient" Steam Navigation Company (limited), associated at present with vessels belonging to the Pacific Steam Navigation Company, run every fortnight from London (South-west India Docks) to Adelaide, Melbourne, and Sydney. The steamers of this line are splendid vessels, of about 4000 to 5000 tons register. They are provided with every accommodation for passengers, including steam heating apparatus, bath-rooms, smoking-room, ice-house, piano, library, etc., and make the passage out in about forty to forty-five days.*

* The following account of the *Orient*, a new steamship added to the fleet of the Orient Steam Navigation Company in September, 1879, is taken from the *Daily News*:—"The total length of the *Orient* is 460 ft., her width 46 ft. 6 in., and her depth 37 ft. 8 in. Her tonnage is 5,400. She is 4,000-horse power nominally, but practically 4,500. She has accommodation for 136 saloon passengers, 138 second-class, and 300 steerage, with further capacity for 250 more. If needed for war purposes she could take 3,000 troops and 400 horses. Every provision for safety in case of accident has been made. Cork life-belts are found in every bunk. The life and other boats are capable of taking off the whole of an average ship's party, and the ship is divided into seven water-tight compartments. Pipes are laid all over in case of fire, so that the vessel might be almost instantaneously flooded. The *Orient* is built expressly for the Australian and New Zealand trade, and, as already stated, is expected to do the voyage to Adelaide in thirty-five days. Her consumption of coal will not be far short of seventy tons per day. Her total weight, with full complement of passengers and freightage, will be about 10,000 tons—her four anchors alone weighing four tons each. The total cost will not be much less than £150,000. Her crew, including stewards, numbers nearly 150."

2. The "Colonial Line," owned by Mr. John Henry Flint, comprises some fine steamers of about 2,000 to 3,500 tons register. These vessels sail from London, and are despatched at intervals according to advertisement.

3. Messrs. Trinder, Anderson and Co., of the "Elder Line," run two or three steamships in connexion with their sailing vessels for Adelaide. The sailings are advertised from time to time.

4. Mention has already been made of the fine vessels belonging to the class known as "auxiliary screws," which are owned by Messrs. Money Wigram and Sons. They comprise the *Somersetshire*, *Northumberland*, *Durham*, and *Kent*—vessels of from 2,000 to 3,000 tons register, all of which have achieved a great reputation for comfort and convenience. The *Norfolk*, which has lately been added to the list, is a vessel of a somewhat different class to the others. She has engines of greater power, and more nearly resembles the full-powered steamers, such as those of the "Orient Line."

The steamships of this line (which are usually despatched alternately with the sailing vessels belonging to the same firm) sail from London at intervals of about six weeks, the exact dates being advertised from time to time.

It will be seen, on looking over the above list, that a passenger wishing to proceed to Australia *by steam* during any particular month will, on an average, have two, or at the outside three, steamers from which to choose; and as each of these vessels will probably be of a different class, there will be no difficulty in arriving at a decision.

But when the voyage is to be made in a sailing vessel the selection becomes a matter of some little difficulty, because there are so many great lines of passenger ships, Many of which offer excellent accommodation.

Perhaps the best known of all the shipping firms is that

of Messrs. Green and Co., of Blackwall, whose magnificent fleet of East Indian and Australian vessels used in former days to rank next to the Royal Navy.

Since the discontinuance of the old passenger route to India by the Cape of Good Hope, the actual number of their sailing ships has been considerably diminished; but, on the other hand, they have added to their fleet some very fine steamers for the Indian voyage through the Suez Canal. They still retain a large number of Australian sailing packets—some being frigate-built ships of the older type, others iron and composite vessels—many of which are amongst the largest and finest sailing ships to be found in the mercantile marine. Although perhaps not so well found, nor so fully manned, as in the palmy old East Indian days, Messrs. Green's ships still maintain their position in the very first rank of Australian passenger lines, and their vessels are in all respects thoroughly reliable.

The firm of Messrs. Money Wigram and Sons was, many years ago, associated with that of Messrs. Green; and when the separation occurred, they took with them the original house-flag, which, according to tradition, they won by lot. In addition to their auxiliary-screw steamships, which have been already mentioned, Messrs. Wigram own a fine fleet of sailing vessels of much the same type as those of Messrs. Green and Co. All that can be said in praise of the ships of the one firm can with equal justice be said with reference to those of the other, both being managed on the same plan.

Messrs. Devitt and Moore have for many years owned or chartered some of the largest and most popular passenger ships in the Australian trade. The firm has recently become associated with that of Messrs. Green and Co., both the lines being now under the same management. Messrs. Devitt and Moore's ships have achieved a great and deserved reputation, especially in the colonies, and the

name of this firm may always be regarded as a guarantee for the excellence of their vessels.

In addition to these there are many other firms of high standing which own lines of vessels for Australia and New Zealand. Amongst them the following may be mentioned :—

Messrs. Anderson, Anderson and Co.'s line of sailing ships for Adelaide, Melbourne, Sydney, Brisbane, etc. These ships, most of which are over 1000 tons register, are despatched at frequent intervals from the South-west India Dock.

Messrs. Trinder, Anderson and Co.'s ships sail from the London Docks for Adelaide generally twice in every month. Their vessels are also occasionally despatched to the other Australian ports. It will be remembered that both the above firms also own lines of steamers for Australia.

Messrs. Houlder Brothers and Co.'s line of clipper ships are despatched from the South-west India Docks for Port Phillip on the 7th and 21st of each month, and for Adelaide every three weeks. Also from Liverpool to Sydney, Melbourne and Adelaide every month.

Mr. John Henry Flint's "Colonial Line" of steam and sailing ships comprises some fine vessels belonging to the latter class. The ships of this line are usually despatched to Sydney.

Other well-known lines are the "Thames and Mersey Line" of Messrs. Gavin, Birt and Co., the "Victoria Line" of Messrs. John Potter and Co., and the "London Line" of Messrs. Taylor, Bethel, and Roberts. Some of these firms despatch ships from Liverpool as well as from London. The ships of the "Scottish Line" of Messrs. M'Ilwraith, M'Eachin and Co. run chiefly to the ports of Queensland, and are despatched from London or Glasgow.

Amongst the lines of passenger ships to New Zealand may be mentioned those of the "New Zealand Shipping Co." and the "Passenger Line." The fine vessels belonging

to both these lines sail at frequent intervals to the various ports of New Zealand.

In addition to the above firms, there are many others trading from the different ports of England and Scotland to Australia and New Zealand.

The particular port of Australia to which the passage should be taken is a point demanding consideration. Formerly—that is to say, some twelve or fourteen years ago—as many vessels sailed from England for Sydney as for Melbourne. After a time Melbourne seemed to absorb the direct trade, and nearly all the ships belonging to the great firms went to that port. Recently, however, New South Wales has been regaining her former influence, and some of the finest passenger ships are despatched direct to Sydney. As already mentioned, a good many vessels are also sent to Adelaide (South Australia), some to Brisbane and the other ports of Queensland, and a few to Hobart Town (Tasmania); while several great lines of vessels run to the various ports of New Zealand. The climate of each of these ports and their suitability to the invalid will be discussed in a future chapter; but, speaking generally, Melbourne will be found the most convenient destination for those who are sufficiently well to undertake a moderate amount of travelling on their arrival in Australia, because not only do many of the finest sailing vessels and nearly all the steamships sail direct to that port, but also because from thence, on account of its central situation, any other part of the colonies can be reached in a few days by local steamers.

Although a separate chapter has been devoted to the consideration of the homeward voyage, it may be mentioned here that all the steamers—including the auxiliary screws—now return from Australia by the Suez Canal; and the sailing vessels, with a few exceptions, by Cape Horn.

CHAPTER IV.

PRELIMINARY ARRANGEMENTS.

Securing a passage and engaging a berth—Personal inspection desirable—Hints on choosing a berth—Furnishing the cabin in sailing vessels—Articles of cabin furniture provided by the owners—Furniture to be provided by the passenger himself: bedding, folding-chair, lamp, bookshelf, carpet, bath, swing-tray, etc., etc.—Trunks and boxes—Travelling chest of drawers—Outfit of wearing apparel—Outfitters—Stores: medicines and sundries—Joining the ship—The ports of departure.

HAVING decided upon his route and time of departure, and chosen the line of vessels in which he will sail, the next thing for the intending passenger to do will be to secure his passage and choose his berth.

When the dock in which the ship is lying is sufficiently near to be easily accessible, it will be always much more satisfactory to see the ship before taking a passage, or, indeed, to compare several ships belonging to the same or rival lines.

This, however, is usually practicable only in the case of sailing vessels, which, remaining a considerable time in dock, afford ample opportunities for inspection. Steamers, on the other hand, are despatched so quickly, that it is often necessary to secure a passage in them before they arrive in dock.

The earlier a berth is selected the better, even in the case of sailing vessels, as the favourite passenger-ships fill up very rapidly, and the best cabins are soon engaged.

Where a personal inspection cannot be made, the owners or their agents will on application send full particulars of the ships, together with the regulations relating to passengers and a plan of the cabins. The position of each vacant berth will thus be seen at a glance, those that are already engaged being usually marked off.

It is, of course, always best to act under the advice of some friend who has been to sea, or who is practically acquainted with ships ; but where such assistance cannot be obtained, the following hints may be found useful.

In all ships that have poops take a poop cabin—*i.e.*, do not be induced to take one on the lower deck.

The dimensions of each cabin in feet and inches are generally marked on the plan, and you will see that the cabins vary more or less in size. *Cæteris paribus*, choose the largest in proportion to the number of berths in it.

Bear in mind that the nearer you approach the centre of the ship the less motion there will be, and that the stern cabins, which are almost always larger than the others, are in *this* respect the least desirable.

The stern cabins have also one or two other drawbacks : they are more liable to be "washed out" in rough weather (especially if they have the large old-fashioned ports), and the noises of the rudder chains and of the waves are apt at times to disturb sleep. But as these are after all comparatively slight inconveniences, the greater size and cheerfulness, and the superior ventilation of the stern cabins will always recommend them, and they usually fetch a higher price than the others.

Avoid taking a cabin in the immediate neighbourhood of the steward's pantry, the storeroom, or the bar, and—in steamers—of the engine-room, and get as near as possible to a skylight or other means of ventilation. It is customary to advise that the cabin should be taken on the windward side of the ship—that is, on that side on which

the wind will most often blow during the voyage. This is no doubt of importance in steamers on the Indian and other hot voyages; but in sailing ships, owing to the frequency with which they change their position by tacking, there is but little difference between the two sides, except perhaps in the trade-wind regions.

In steamers the number of berths in each cabin varies from two to four or even six; in auxiliary-screws each cabin contains usually either two or three berths, an additional payment of about fifteen per cent. securing the half share. In sailing vessels, however, it is seldom that more than two passengers are put into each cabin; whilst by paying an additional fifty or sixty per cent. upon the passage-money it is generally possible to secure the whole cabin.* Of course, when a ship does not fill up, it is often possible to secure the sole use of a cabin without additional payment.

In choosing a berth do not, if you can help it, take one that is either over or under another berth, for both positions are undesirable, although unfortunately such an arrangement is, from the economy of space so obtained, a very frequent one on steamers. Choose, if possible, a cabin in which the berths are on different sides. Select a berth *opposite* a port if you can, but not *under* one, or you may, when you least expect it, get "a sea" in, and be exposed for days afterwards to that crowning discomfort of sea life—wet bedding.

It is customary when a berth is engaged, by letter or

* If the passenger is a confirmed invalid, and is not accompanied by friends, it will of course add immensely to his comfort if he can arrange to travel with a medical man, or, at any rate, if he can take with him an experienced male nurse or attendant, who would share his cabin and give him any attention he might require. Indeed, where a patient goes to sea seriously ill, such an arrangement is indispensable. It need not be said, however, that the expense is considerable.

otherwise, to pay half the passage money (sometimes a less sum) as deposit, the balance being paid a few days before sailing, when you will receive a properly filled up contract ticket, which it is advisable to preserve carefully, as it is sometimes required for official purposes.

The next point for consideration is the fitting up of the cabin—that is, in those cases in which it has to be done by the passenger himself. In all steamers (I believe there are no exceptions) the cabin fittings and furniture, as well as bedding, bed-linen, and towels, are provided by the owners. The passenger has therefore nothing to do but to walk on board with his baggage and take possession of his cabin. He will there find his berth—which to a landsman's eyes looks preposterously narrow—containing his bedding, ready prepared for occupation. There will also be a fixed washstand (with water laid on to a tap), to be used throughout the voyage jointly with the other occupants of the cabin. The furniture will be completed by a strip of carpet for the floor, a curtain at the head of the bed, a looking glass, and a lamp, or some other means of lighting the cabin.

But in a sailing vessel things are very different. Some few years ago your passage-money entitled you only to your share of a cabin with four bare walls. Now, most of the owners provide the following articles—viz., a fixed berth or sleeping place, a looking-glass, a rack to contain a water-bottle and tumblers, and a fixed washstand with more or less complete fittings. I say advisedly more or less complete, for the washstand fittings provided in different ships vary greatly ; and, trifling as such a matter may seem, it will be advisable, if possible, to ascertain before starting exactly what *is* provided, as it is exceedingly uncomfortable during a long voyage to find oneself without some necessary article, such as a wash-hand basin,

a water-can, or a water-bottle ; and, once afloat, it will be next to impossible to supply any such deficiency.*

The passenger who is bound on a voyage to Australia in a sailing vessel will find that, in addition to the fittings provided by the owners, it will be necessary to obtain for himself a good many articles of cabin furniture before he will be able to start upon his journey with any prospect of comfort.

The first thing to see to will be the *bedding*, which, although reduced to the narrowest dimensions by the width of the berth (2 ft. 6 in.), is an important consideration. I cannot too strongly recommend the purchase of a *horsehair* mattress, which, although dearer, is far more comfortable, cleanly and wholesome than any other kind. A horsehair bolster, a pillow, blankets, and a good railway rug (to act as a coverlet) will also be required, together with the necessary bed-linen.†

A *folding chair* will be convenient, not only in the cabin but also for use on deck. It should be as light and portable as possible.

A lamp of some sort will be required. Those usually sold are small spring lamps (to burn Price's candles) mounted on a swivel arrangement which, when secured to the wall of the cabin, always ensures an upright position. I have however found a small brass flat candlestick heavily weighted with lead quite as useful as, and less troublesome than, a lamp.

A small *bookshelf*, with a bar in front to prevent the books falling out, is very useful to hold the supply of literature which is almost indispensable during a long voyage.

* In some ships, by extra payment, the passenger may be supplied with all cabin requisites, bedding, linen, etc.

† Sheets are by no means a necessity if a pyjama sleeping suit be worn.

A *strip of carpet* or a rug for the bedside is a luxury which can be dispensed with without much inconvenience, except, perhaps, during the colder parts of the voyage.

A *water-can* (unless provided by the ship) is a necessity. It should hold nearly a gallon, and should be of a "squat" shape, not liable to fall over.

A small *portable bath* of some kind will be found a great comfort. It must, however, be either a folding bath or quite a small one, as otherwise it will take up too much room in the cabin.

Where a convenient place can be found for hanging it, a *swing-tray* is sometimes useful in a cabin. It consists merely of a round japanned tray of about twelve inches in diameter, hung by cords or chains from the deck overhead. It is used for holding anything liable to spill (such as a glass of water) in rough weather.

A "*cabin pocket*" is amongst the most useful and indispensable of the articles for cabin use. It consists of a piece of holland or other material divided into compartments or pockets for the reception of brushes, combs, slippers, bottles, etc., etc. This arrangement is nailed against the cabin wall, and is effectual in preventing those erratic movements to which small loose articles are so liable on board ship.

When the cabin is sufficiently large, a small, firmly-fixed *table* will be found most convenient during a long voyage. It can only be introduced, however, jointly with the other occupant of the cabin ; and this is one of the many instances in which it will be seen at once that it is of great advantage either to travel with a friend or attendant, or, at any rate, if possible, to make the acquaintance of your future travelling companion before starting, as many articles of cabin furniture will do for joint use, and need not be provided in duplicate.

A curtain for the door, hung upon a semicircular rod of

iron, is very useful, especially in hot weather, as it allows of the cabin door being left open during the night, greatly to the improvement of the ventilation.

A small curtain for the head of the bed may also be provided, if desired.

During a long voyage a good deal of wearing apparel will of course be required, and the form and size of the *trunks* or *boxes* in which it is to be taken will be a consideration. In all steamers the amount of personal baggage is strictly limited to a certain number of cubic feet, and the most convenient form of box for cabin use in steamers is the "overland" trunk. In the Peninsular and Oriental Company's steamers the size of the trunks is limited to 3 ft. × 1 ft. 3 in. × 1 ft. 3 in.; and although other companies allow them to be of a somewhat larger size, yet, where much travelling is to be undertaken, the smaller the trunks are the more convenient they will be found.

In a sailing vessel, however, in which the allowance of luggage is much more liberal than in steamers, and there are no restrictions (within reasonable limits) as to the size of the packages, *a travelling chest of drawers* will be found most convenient for cabin use. It consists of a small, strongly made chest of drawers, divided in the middle in such a way as to form two boxes of moderate size. The front of each portion is made to close with a cover when removing from place to place. Although very suitable for cabin use, it must be acknowledged that these two chests form rather clumsy and cumbersome packages for travelling on land. The convenience of the chest of drawers when in use at sea may be greatly increased by having a rim of wood (about an inch and a half deep) made to screw on to the top round the edge. In this way a most useful table is made, upon which numbers of things may be placed without fear of their slipping off in rough weather.

Should ornamentation be desired, the addition of a few small *pictures* in gilt frames will make the cabin look bright and homelike.

Wearing Apparel.—With regard to the outfit of wearing apparel, it is possible only to speak generally, as it will vary greatly according to individual requirements and the voyage to be taken. The invalid should bear in mind that the English Channel is almost always cold, even in summer. In the Australian voyage, cold weather lasting several weeks is also always met with south of the Cape, and must be provided for, especially as it follows so closely upon the heat of the tropics. A thick warm suit of clothes should in every case be provided, as well as under-clothing to match; also a warm overcoat, and another of lighter material. For the warmer parts of the voyage, suits of thinner woollen materials, such as serge or flannel, are recommended; and one or two coats of China-silk or cashmere for cabin use in equatorial regions. There is generally so much humidity in the air at sea, that I should strongly advise all invalids to abjure linen shirts, and to wear only flannel—thick for cold and thin for warm latitudes. Under-waistcoats should, in my opinion, always be worn. Even in the warmest weather a thin India gauze under-waistcoat will generally be found more comfortable than none at all.

It is customary on board ship to wear white canvas shoes during the warmer weather, and these certainly have the advantage of requiring no blacking; but I should advise the invalid to take with him, in addition to thinner shoes, one or two pairs of thick strong boots, made as waterproof as possible with dubbing or grease, for use when, as is so often the case, the decks are wet and sloppy, either from the weather or from being washed.

While passing through the tropics, it is often found almost

impossible to bear bed-clothes of any kind over one. A sheet is even more uncomfortable than a blanket, and a cotton or linen night-dress is an abomination. For use under these circumstances, and indeed during the whole voyage, the traveller is strongly recommended to provide himself with one or more sleeping-suits of thin flannel, consisting of a shirt and a loose pair of drawers, or "pyjamas," made to tie round the waist. Bed-clothes may then be boldly dispensed with, and the gain in point of comfort can only be appreciated by those who have tried both plans.

The best way of determining the amount of wearing apparel, linen, etc., to be taken, is to make a rough calculation based upon the probable length of the voyage and the number of articles generally used per week. It must be borne in mind that the services of a laundress are not obtainable on board ship, and although the sailors will sometimes wash clothes for the passengers, this cannot always be depended upon.*

All necessary articles, both for cabin use and personal outfit, may be obtained at any of the respectable outfitters' that are to be found in the neighbourhood of Fenchurch Street, London. At some of these establishments an outfit for any purpose—from a voyage to the North Pole to an expedition to Central Africa—may be obtained at a few hours' notice.

Every British seaport of any importance has also usually one or more outfitting establishments, at which all the requisites for a voyage may be obtained.

* In the above hints as to wearing apparel at sea, no special reference has been made to ladies' dress: first, because it can be arranged on the same general principles that have been indicated; and, second, because, in the author's opinion, the discomforts of a long voyage in a sailing ship are, for an invalid lady, so much greater than for a man, as to render it very doubtful if such patients should be sent to sea at all.

In an appendix is given a list of the various articles that may be required for use during a long sea-voyage. It is, however, intended more as a memorandum than as a statement of the actual requirements of *every* passenger, and the list should be reduced to the *smallest possible* dimensions that are compatible with comfort.

The outfitter usually undertakes to deliver on board ship and to place in the cabin all articles that are purchased of him; and he will also, if desired, do any fitting up or fixing that may be necessary. Great care should be taken that everything that is likely to shift its position (such as chests, boxes, etc.) is properly secured; or in nautical language, "cleated and lashed"—*i.e.*, prevented from sliding by little blocks of wood (cleats) which are screwed to the deck; and lashed down to the deck by means of thin cord and screw-eyes.

Nothing is more unpleasant than on the first rough day to find all your cabin Penates lying in a confused heap to leeward; and although the ship's carpenter may sometimes be prevailed upon to cleat your belongings, it is always better to get it done before sailing, either by the outfitter's man or a man of your own. Of course these remarks apply only to sailing vessels.

There are a few sundries in the way of stores with which an invalid may find it well to provide himself when starting on a long voyage: a few tins of preserved milk, some Liebig's extract of meat, a bottle or two of effervescing citrate of magnesia (so called), and some mild aperient medicine of whatever kind he is accustomed to take, will all be found useful. A small filter (a "pocket filter" answers very well), and some contrivance for heating water by means of spirits of wine may be added with advantage, as clear drinking water and hot water are both rather difficult to obtain on board ship.

All preparations being now completed, the cabin fitted up and the baggage on board, nothing remains but to join the ship.

Many of the steamship companies grant facilities to intending passengers in the shape of free railway passes from London to the port of departure, or else they issue tickets at reduced fares.

In some cases the passenger has the option of embarking at one of two ports. Thus passengers by Messrs. Wigram's *steamers* may join either at Gravesend or Plymouth; while in the case of the Union Company the choice lies between Southampton and Plymouth; and in the case of Messrs. Donald Currie and Co., between London and Dartmouth. Some of Messrs. Green's ships call at Plymouth. Where this option is given, it becomes a question whether to go on board at first or to choose the port that is farthest down channel. In summer and in fine weather the run down channel is often very pleasant, passing, as one does, so many familiar places along the coast. There is also time to settle down before the remainder of the passengers come on board; and the apprenticeship to sea-sickness, if it *must* be served, is partly, if not entirely, got through before making a final start. In the late autumn or winter, however, it is advisable that as much as possible of the Channel should be avoided, as the weather is then often cold and trying to invalids, and the passage, particularly in a sailing vessel, is often tedious and not without risk.

CHAPTER V.

LIFE AT SEA.

The Australian voyage—Commencement of the voyage—Sea-sickness—Daily routine—General arrangement of the ship—Meals on board ship—Quality of the various articles of food in sailing vessels—Unavoidable defects of the dietary on long sea voyages—The quantities of provisions consumed during an Australian voyage—List of officers, crew, etc., of a large passenger ship—Mode of indicating the time: the "bells"—Taking the noon "sights"—Dimensions of a large sailing vessel.

AS it would be impossible within the limits of a work such as the present to give a detailed description of each voyage that has been mentioned, I have chosen one—the voyage to Australia by way of the Cape of Good Hope—to illustrate life on board ship, and to show the intending voyager, as faithfully as may be, what he has to expect in the way of comfort and discomfort; climate, food, amusement and occupation during his absence from his native shores.

The Australian voyage has been selected for several reasons. It is the one most frequently taken by invalids; it is the longest; and as all the latitudes which are traversed in the other voyages are sailed through on the way to Australia, the description of each region of the ocean may, *mutatis mutandis*, be applied to most other routes. A sailing vessel has been chosen because it gives, on the whole, a better illustration of true sea life than a steamer.

We will suppose, then, that the reader, having sailed down the English Channel with fine weather and a fair wind, and having watched the last point of the familiar English coast as it vanished from the distant horizon, has now fairly entered upon his ocean voyage. The attention of all on board, hitherto engrossed by surrounding objects, will now be turned to the ship in which they are destined to spend so many days and weeks.

But it is probable that by this time the traveller, if not a good sailor, will have been aware of certain uncomfortable sensations which have forcibly reminded him of the fact that he is now no longer on dry land ; and if this should be the unfortunate experience of the present reader, I cannot do better than refer him at once to the hints I have endeavoured to give in Chapter VIII. upon the management of sea-sickness, and for the present draw a curtain over his sufferings.

What with unavoidable "attention to private affairs," bad weather, and the confusion inseparable from the commencement of a long voyage, it is generally not until the Bay of Biscay has been passed that the passengers begin to settle down to regular habits, and the many gaps that have hitherto been seen on the benches down the sides of the saloon table begin to be filled up at meal-times. At last, however, brighter skies and calmer weather tempt even the worst sailors from their cabins, and all begin to take more or less interest in their novel mode of life.

The daily routine on board a sailing vessel is always pretty much as follows : About five o'clock in the morning you are probably awakened by that most noisy of operations, washing decks. If "holy-stoning" is also in vogue, the pounding, scraping and grinding noises which go on over your head will effectually banish sleep unless you are a very determined sleeper indeed.

At 8 o'clock the dressing-bell rings; but in the warmer latitudes most of the passengers have been up long before that time, have had their bath, and are promenading on deck to encourage appetite, or are more quietly enjoying the cool and refreshing morning breeze. At 8.30 (in some ships 9 o'clock) the breakfast bell summons the passengers to a very substantial meal, to which they probably do good justice, as by this time their sea-appetite has most likely set in in earnest.

Lunch is at twelve o'clock; this is the time also for taking the noon "sights," to determine the position of the ship and the progress she has made since the previous day. The result is usually chalked upon a board for the information of the passengers.

Dinner, which in most ships is at 4 o'clock, is another of the events of the day. Tea is at 7, and at 9 biscuits and hot and cold water for grog are put upon the table. At 10 o'clock the lamps in the saloon are put out, and all lights in the cabins have (nominally) to be extinguished by 10.30 p.m.

For the benefit of such readers as have had no previous acquaintance with matters appertaining to the sea we will now look round the ship, and endeavour to get some idea of its general arrangements.

In most passenger sailing vessels the first-class saloon occupies the after part of the ship, extending from the stern nearly as far forwards as the mainmast. In poop ships the saloon and principal sleeping-cabins are built above the main deck, and the raised deck that covers them is called the poop-deck. In flush-deck ships the whole of the passenger accommodation is below the main deck. In most ships the saloon, which is necessarily long, low and narrow, runs "fore and aft," and has the sleeping-cabins on either side. In a few vessels, however, it is still

"athwart ships"—*i.e.*, transverse in direction. It is lighted from above by means of long skylights, and has a table down the centre, with fixed benches on either side.

Above the table are swinging lamps, swing-trays, and racks for glasses and bottles.

The lower deck, which (in poop ships) communicates with the saloon by a short staircase, generally contains at its after part extra first-class cabins and the rooms of some of the officers; while farther forward, and partitioned off by a "bulkhead," is the second-class department, and farther forward again the third-class.

Returning to the upper deck by the "companion hatch," we find near the mainmast the galley in which the cooking for the whole ship is carried on, and done, too, with a rapidity and excellence which seem a mystery when one sees the very small space which the cook has at his disposal. Farther forward, in the bows of the ship, we see the forecastle, in which the sailors have their quarters; and near this is generally to be found the small deck-house inhabited by the cow, usually a great pet of the tars. On the top of the galley, in the long-boat, and in other apparently strange positions, may be noticed the pens, or rather cages, containing the sheep, pigs, geese and other live stock.

The poop-deck above the saloon is kept exclusively for the use of the officers and the first-class passengers. There the deck is scrubbed and scoured until it is specklessly white and clean, and the ropes are neatly coiled by the midshipmen, whose special domain it is.

All round the sides of the poop are the hen-coops, the tops of which serve as seats, and inside which are the poultry, whose melancholy fate it is either to be eaten or to die a natural death before the end of the voyage; and who avenge themselves by smelling very unpleasantly in the hot weather, and (in the case of the cocks) by crowing vociferously at all hours of the night. Here—on the poop

—congregate the passengers day after day during the long voyage, reclining in their chairs in all stages of laziness, or walking industriously backwards and forwards for exercise; and from hence they survey, as from a tower, the sea, the sky, and all that goes on in the ship either on deck or aloft.

Food, which is a matter of importance to every one, is more especially of moment to the invalid. I will therefore endeavour to give some idea of the fare on board an average Australian passenger ship.

For the first week or two you might be inclined to wonder at the variety of dishes that appear at each meal, but after a time you find that it is a variety that repeats itself day after day, and which becomes at last rather wearisome.

The breakfast consists of broiled and cold ham, cold meat, grilled bones, rissoles, mutton cutlets, preserved fish of various kinds, potted meats, marmalade or preserves, tea, coffee and cocoa. In many ships hot rolls are provided every morning, and, by special desire, porridge is sometimes added to the bill of fare.

The luncheon varies in different ships. In some, only bread, cheese, butter and biscuits are put on the table, but in others cold meats, preserved salmon, Australian meats, etc., are provided.

Dinner commences with soup, followed by joints of mutton and salt beef, and sometimes joints of pork; fowls, ducks, and occasionally geese; made-dishes composed of mutton and preserved meats cooked in various ways; potatoes and preserved vegetables of various kinds. In Messrs. Green's and in Wigram's ships currie is always served as a separate course. Then come pastry and puddings, cheese, and finally a dessert, which for the first few weeks perhaps boasts some dishes of apples and pears, but towards the end of the voyage consists only of almonds and raisins, nuts, and similar dry fare.

A few words may now be said as to the *quality* of the various articles of diet on board a sailing vessel and their suitability for the invalid.

Meat.—Fresh beef is of course a thing unknown, except for the first few days after leaving port. Mutton forms the staple diet, and fortunately English sheep thrive well at sea, and the mutton is generally fairly good, although in the warm weather it has necessarily to be eaten so soon after being killed that it is often tough. Pork is, for the most part, excellent, as the pig, like the sheep, takes remarkably well to ship life. Pigs are generally only killed during the cooler parts of the voyage. Poultry, on the other hand, never seem to thrive at sea, and the skinniness, toughness, and want of flavour of the fowls and ducks is beyond belief. Those of them however that survive to the latter part of the voyage, escaping not only the butcher's hands, but also a high rate of mortality from natural causes, sometimes recover their condition and become more eatable. The geese are, as a rule, a shade better than the fowls and ducks.

Bread is usually fairly good considering the circumstances under which it is made ; but towards the end of the voyage the flour sometimes deteriorates, and often contains weevils ; the same remark applies to pastry.

Potatoes are pretty good for the first month or two, but before the voyage is over they frequently become bad and sometimes fail altogether. It is then necessary to fall back upon the stock of preserved potatoes, which, for a continuance, are neither very wholesome nor inviting.

The cow, by habit, becomes so good a sailor that she will often give a full supply of milk during the whole voyage, but it sometimes happens that the artificial conditions under which she is placed tell after a time upon her constitution, and the supply fails. So long as there is plenty of good preserved milk this is not of so great consequence, but if

that also fails through the supply being inadequate, the want becomes a serious one, especially for children and invalids. For this reason the traveller has been advised to provide himself with a small private stock of preserved milk, which will be found a valuable supplement to that supplied by the ship.

Butter is seldom good. It is necessary thoroughly to salt it in order to preserve it for the voyage ; and although the steward does his best to remedy this by having the butter well washed before use, it is never very inviting at any time, and in the hot weather is still less attractive.

Preserved stores.—The art of preserving vegetables has been brought to so great a perfection that dishes of green peas, French beans, carrots, parsnips, etc., are often put upon the table that could scarcely be distinguished from the freshly gathered vegetables. The same may be said of preserved fish, the tinned salmon being particularly good.

Wines, spirits, etc.—Several years ago it was the custom in some of the lines of sailing vessels to include beer, wine and spirits in the passage-money, which was then rather higher than it is now. But the universal custom at present, both in sailing ships and steamers, is for the passenger to purchase these things for himself. They are supplied on board at fixed prices which, although somewhat high considering their quality and the fact that they pay no duty, are not exorbitant. An account is delivered to each passenger by the head steward at the end of every week, and there is no doubt that, on the whole, this arrangement is far preferable to the old one.

It will be seen from the foregoing remarks that the great drawbacks to the dietary on board a sailing vessel are the want of fresh vegetables, fruits, salads, eggs and butter, and the tendency of the stores to deteriorate towards the end of the voyage. In a steamer the comparative shortness of the voyage, the usual provision of an ice-

room, and the fact that it is generally necessary to call at some port to take in coal, all tend to make the fare better and more varied. In addition to this, the efforts of the commissariat department, which may be kept up to the mark for a month or six weeks, are apt to flag during a voyage of three or four months. At the same time it must be clearly understood that, although the fare is perhaps not so luxurious as in a steamer, there is nothing in the dietary of a sailing vessel that need prevent an invalid choosing the latter; or that would in any way prevent his deriving full benefit from the voyage.

Before leaving this part of the subject it may not be uninteresting to the reader to know the quantities of the various stores that are required for a voyage to or from Australia. The subjoined list was given me by the captain of a favourite Australian ship, as the quantity laid in of each article named for the return voyage:—173 sheep, 30 pigs, 18 sucking-pigs, 720 fowls, 420 ducks, 144 geese, 1 cow;—flour, 12 tons; sugar, 2½ tons; butter, 1 ton; biscuits, 3 tons; preserved meat, 6,000 lb.; salt meat, 6,200 lb.; soup in tins, 1,200 lb.

There were on board 73 first-class, 37 second-class, and 25 third-class passengers, together with a crew of 62 all told, making a total of 197, including about 30 young children.

As a large passenger vessel is not only a ship, but also a floating hotel, it may be imagined that many and various officials are required both for its navigation and for its commissariat department. It may therefore be interesting to the intending passenger, to be furnished with a list of the officers, crew, etc., of a first-class Australian ship of moderate size. The following will represent the average ship's company on board one of Messrs. Green's or Wigram's sailing vessels:—

Captain; first, second, third, and (sometimes) fourth officers; from four to eight midshipmen; surgeon; boatswain; carpenter; sailmaker; engineer; three or four quartermasters; from twelve to sixteen able seamen; from two to four ordinary seamen; three or four boys. Chief steward; four to six cuddy servants; pantry-boy; second class steward, third-class steward; midshipman's servant; captain's cook, ship's cook; baker; butcher, butcher's mate; storekeeper.

Amongst the novelties on board ship one of the first to attract one's attention is the method of indicating the time. Every half-hour one of the midshipmen strikes "the bells," which by no means coincide with the striking of a clock. Thus, at half-past 8 in the morning *one* bell is struck; at 9 *two* bells; at half-past 9 *three* bells, and so on up to 12 o'clock noon, when *eight bells* are struck. They then begin again in the same order from one to eight. *Eight bells*, therefore, always indicates either 4, 8, or 12 o'clock, and is the signal for *changing watch*. But from 4 to 8 in the afternoon the order is a little different, because then the watches last only *two* hours instead of four, and are called the "dog watches." The order of the bells is then 1, 2, 3, 8; 5, 6, 7, 8. You will notice that the strokes are struck in pairs—*e.g.*, five bells are struck thus: 1, 2—3, 4—5.

One of the great events of the day, as before mentioned, is the taking of the noon "sights" for longitude. Most of the officers then turn out upon the poop, and with their sextants take frequent observations of the sun until he passes the meridian. These observations (in connexion with others taken earlier in the morning for latitude) give the exact position of the ship at twelve o'clock, and, as a deduction, the distance she has sailed since noon on the

previous day—or, as it is generally called, "the day's run."

The result is chalked on a board for the benefit of the passengers, and gives rise to much interest and speculation, bets being frequently made on the day's run. Even sweepstakes are sometimes got up amongst the passengers.

The noon "sights" also determine the actual time by the sun, and the ship's clock is therefore corrected at twelve o'clock each day. When travelling due east or west the loss or gain in time each day is considerable. As the difference of time for each degree of longitude is about four minutes, and as a fast ship will often accomplish six degrees of easting when running before the strong westerly winds south of the Cape of Good Hope, the clock has sometimes to be put on as much as twenty-four minutes at a time.

If after leaving England a passenger keeps his watch going without correcting it, the difference of time becomes at length rather startling, but if he perseveres until he reaches the Antipodes it will, of course, have corrected itself, because the difference will then be twelve hours.

During a long sojourn on board a fine ship it is natural to become interested in everything connected with her. Her rate of sailing, her dimensions, the height of her masts, the number and size of her sails, all become objects of attention to an inquiring mind. The reader may therefore be interested in the following particulars with reference to a passenger ship in which the author lately returned from Australia.

The ship in question was a "composite" ship—that is, she was built of solid teak with iron beams and framework. She was of 2,130 tons register, 3,500 tons burden. Her length was 300 feet, her breadth 40 feet ; extreme depth of hold 28 feet. The height of the mainmast (which in

common with the other masts was of wrought iron, was 189 feet, 29 feet being below the main deck. The length of the main and fore yards was 90 feet; lower topsail yards 76 feet; upper topsail yards 56 feet; royal yards 44 feet. All the yards were of steel.

The following is a list of the sails, with the quantity of canvas contained in each :—

MAINMAST.

Mainsail . . .	720 yds.	Topmast-staysail .	330 yds.
Two maintopsails .	700 ,,	Topgallant ,, .	260 ,,
Topgallantsail . .	280 ,,	Royal ,, .	188 ,,
Royal . . .	193 ,,		

FOREMAST.

Foresail . . .	583 yds.	Royal . . .	180 yds.
Two foretopsails .	700 ,,	Topmast staysail .	165 ,,
Topgallantsail . .	280 ,,	Three jibs . .	600 ,,

MIZENMAST.

Crossjack. . .	300 yds.	Topmast staysail .	327 yds.
Two mizentopsails .	450 ,,	Topgallant ,, .	210 ,,
Topgallantsail . .	190 ,,	Spanker . . .	280 ,
Royal . . .	120 ,,		

Giving a total of 7,056 yards, or not far short of *two acres,* of canvas.

CHAPTER VI.

COURSE, CLIMATE AND WEATHER.

Course of a sailing vessel bound for Australia—The "regions" of the ocean—Climate and weather experienced in the various portions of the Australian voyage—The English Channel—Bay of Biscay—Northern region of prevailing westerly winds—The calms of Cancer—Region of north-east trade-winds—The equatorial calms or "doldrums"—Equatorial rains—Region of south-east trade-winds—Calm-belt of Capricorn—The southern region of prevailing westerly winds—Course of sailing vessels between the longitude of the Cape and Australia—The "roaring forties"—Occasional gales—Rapid alteration of apparent time—Temperature—Reversal of the characteristics of the winds—Effects of the cold weather on invalids.

IF we examine the ordinary track of a sailing vessel bound for Australia,* we shall find that the general direction in which she shapes her course after leaving the English Channel is (speaking roughly) S.S.W. as far as the equator; from thence nearly S.E. as far as the meridian of the Cape of Good Hope; and from that point to Australia nearly due east.

During the first two portions of this course—viz., from the English Channel to the Cape—the vessel traverses districts of the ocean in which great and varied changes of climate and weather are experienced.

As regards the temperature, it may be stated in general terms that the heat increases until the equator is passed, and afterwards diminishes until the extreme southern limit of the voyage has been reached.

With regard to weather, however, it will be found that

* *See* Map.

different latitudes possess peculiarities of their own, which are marked with tolerable distinctness both in the northern and in the southern hemispheres.

In consequence of these peculiarities the ocean has been divided by physical geographers into *regions*, the principal of which—taken in the order in which they are traversed—are (1) the northern region of prevailing westerly winds, (2) the calm-belt of Cancer, (3) the region of the north-east trade-winds, (4) the equatorial calm-belt, or "doldrums,' (5) the south-east trade-wind region, (6) the calm-belt of Capricorn, and (7) the southern region of prevailing westerly winds.

It will not, of course, be expected that these regions present any sharply defined limits. They merge one into another almost imperceptibly, and they also change their position to a certain extent according to the season of the year. Still, on the whole, they possess in a marked degree the characteristics ascribed to them.

I will endeavour to give a brief general description of the climate and weather to be looked for in these various portions of the voyage and their effects upon invalids.

As mentioned in a previous chapter, the weather usually experienced in the English Channel, and in fact in all the seas around our coasts, is exceedingly trying to invalids. In late autumn and winter, rain, cold winds, and even gales, are to be expected; and even in the summer months the weather is frequently cold, especially at night. Wind, weather and temperature are all far more variable near land than quite out at sea, and while one day may be calm and warm, with bright sunshine, the next may be rough, cold and rainy.

Hence the invalid leaving England in the autumn cannot be too careful during the first few days of the voyage. He should wear warm clothing, wrap up well when on deck, and avoid exposure to rain and night air.

The weather met with while passing the Bay of Biscay is but little better than that of the English Channel. Here heavy rolling seas are often experienced, together with strong winds and frequent rain. But on the whole the temperature is appreciably higher than it is off the coast of England.

As soon, however, as Cape Finisterre has been passed (which, with a favourable wind, will be on the third or fourth day after leaving Plymouth), more pleasant weather may be expected, and the passenger who, recovering from sea-sickness, goes on deck now for the first time, will be astonished at the changed aspect of affairs. The gray clouds and turbid sea of the Channel and the Bay of Biscay are replaced by a blue sky and bright blue waves, while the temperature has risen some 8° or 10°, and the air is mild and balmy.

This kind of weather, interrupted by occasional showers and accompanied by variable winds, sometimes strong and sometimes light, but for the most part from the west or south-west, continues until the ship has reached a latitude of about 30° to 35° N., when she enters a narrow belt of calms—the calms of Cancer—whereas hitherto since leaving the Channel she has been sailing in that region of the sea known as the *variables*, or the *region of prevailing westerly winds.*

This arbitrary division of the ocean extends from the Arctic regions on the north to the calm-belt of Cancer on the south, and has received the designation by which it is known because in these latitudes the winds, although variable, are (taken all the year round) more or less westerly in direction in the proportion of *two* days to *one*.

The Calms of Cancer, which are entered at a latitude of about 30° to 35° N., according to the season of the year, are otherwise called the "Horse Latitudes," "from the

circumstance that vessels formerly bound from New England to the West Indies with a deck-load of horses were often so delayed in this calm-belt that for want of water for their animals they were compelled to throw a portion of them overboard."*

The calm-belt of Cancer extends over about six degrees of latitude, and its position changing with the season, is farthest north in the autumn and farthest south in the spring.

In the "horse latitudes" calms and light or baffling winds may be expected; but however vexatious the delay caused by these may be to the captain and officers of the ship, and to those of the passengers who are in a hurry to reach their destination, invalids and health-seekers will generally find the weather here very delightful, and will be able to sit about on deck all day without wraps, enjoying the calm sea and the bright sunshine. The thermometer, which in the English Channel indicated perhaps 45°, will here have risen to about 70°—a most enjoyable temperature, and one that suits all sufferers from chest complaints most admirably.

It must not be imagined that this region of the calms of Cancer is a district that is always clearly defined and mapped out by the characteristics of the weather experienced in it. Sometimes a ship may pass through it without experiencing any calms whatever, but as a general rule the weather in these latitudes will be such as has been described.

When the ship has reached a latitude of about 25° to 30° N., according to the time of year, the light variable winds begin to draw round to the north-east, and at last freshen to a steady breeze from that quarter. The ship is now in the *region of the north-east trade winds*, and every stitch of canvas is set so as to make the most of the favourable breeze.

* Maury.

It will soon be noticed by those who have not been to sea before that the trade wind is altogether unlike any wind that they have experienced on land. It has no gusts or inequalities, but is one continuous and perfectly steady current of air, remaining at the same strength and in the same direction hour after hour and day after day, so that sometimes, even for days together, scarcely a sail has to be trimmed or a rope to be touched.

The appearance both of sea and sky in the trade-wind region is very characteristic. The sea, in place of the greasy or glassy surface which it exhibited in the calm-belts, is covered with crisp, curling waves, whose summits are crested with white foam, and the sky, although for the most part clear and blue, is dotted here and there with the small detached clouds which are almost peculiar to these regions.

I cannot do better than give Lieutenant Jansen's description of this region of the sea as quoted by Maury. He says: "When . . . ships which have lingered in the calm-belt run with the north-east trade and direct their course for the Cape Verd Islands, then it seems as if they were in another world. The sombre skies and changeable—alternately chilly and sultry—weather of our latitudes are replaced by a regular temperature and good settled weather. Each one rejoices in the glorious heavens, in which none save the little trade-clouds are to be seen; which clouds in the trade-wind region make the sunset so enchanting. The dark-blue water, in which many and strange kinds of *echini* sport in the sunlight, and when seen at a distance make the sea appear like one vast field adorned with flowers; the regular swellings of the waves, with their silvery foam through which the flying-fishes flutter; the beautifully coloured dolphins; the diving schools of tunnies,—all these banish afar the monotony of the sea, awake the love of life in the youthful seaman, and attune

his heart to goodness. Everything around him fixes his attention and increases his astonishment."*

Speaking roughly, the belt of the north-east trades occupies about twenty degrees of latitude, but its breadth and position vary in common with the other regions, all of which, as before mentioned, shift their places within certain limits, following the sun as he travels either to the north or the south of the equator.

Although the quarter from which the trade wind blows may shift through several points of the compass, yet its general direction is always pretty much the same. As a rule it blows steadily and constantly from its commencement to its termination, but it is sometimes interrupted by "flaws," and occasionally it is broken up by gales or hurricanes. Invalids usually greatly enjoy what has been called the "champagne atmosphere" of the trade winds, and the steady breeze and the rapid rate of sailing are pleasant and invigorating to all. The temperature is singularly equable, the daily range of the thermometer being only 3° or 4° in the twenty-four hours. At the same time there is always a certain amount of chilliness about these winds, even though the actual temperature may be higher than it was in the calms. This is no doubt partly owing to the rapid movement of the air, but it is also due in a great measure to the large amount of moisture contained in it. The reason of this dampness will at once be evident when we consider that the trade winds are the great evaporating winds, carrying moisture to all parts of the earth. The depth of water evaporated from the surface of the sea by the north-east and south-east trade winds has been variously computed at from eight to sixteen feet during the year!

It is probably owing to the presence of this large amount of moisture in a current of air constantly in motion, that

* Maury's "Physical Geography of the Sea."

the trade-wind regions do not, as a rule, suit those who suffer from rheumatism, neuralgia, or sciatica. The rheumatism, however, is seldom of an acute type, and the neuralgia, though painful at the time, will generally pass off as soon as the trade-wind region has been left behind.

The Belt of Equatorial Calms.—A few degrees to the north of the equator (about 10° N. in November) we enter the equatorial calms, or "doldrums," of evil reputation. From my own experience, however, I am inclined to think that the discomforts of this part of the voyage have been much exaggerated.

The sea and sky here have a very different appearance to that which they presented in the trade-wind regions. Calms and light airs prevail, and the sea is either of a deep glassy blue under a scorching sun, or black as ink under a leaden sky. The dense clouds that so often obscure the heavens in this region have caused it sometimes to be called the "equatorial cloud-ring." From these massive clouds, from time to time, deluges of rain descend, with a violence unknown in more temperate climes. Nor are they always passing showers, for sometimes they will continue with a steady downpour for twenty-four hours at a time, or even longer.

Though both rain and clouds fulfil a most important part in tempering the heat of these equatorial regions, still they certainly have their discomforts for voyagers, for everything becomes saturated with moisture, and the atmosphere, steamy and oppressive, acts as a constant vapour-bath.

The sense of heat that is experienced is out of all proportion to the actual temperature, for the thermometer very rarely rises higher than 83°—the highest shade-reading on deck that I have ever seen in a sailing vessel being 85°. In a steamer, however, the temperature will sometimes reach 89° or 90°, owing no doubt in part to the heat of the

furnaces. The heat in the cabins is of course higher by several degrees than it is on deck, and this is particularly the case in steamers and in iron vessels.

As these temperatures are scarcely higher than those experienced during hot summers in England, we must conclude that the oppressiveness of the equatorial calms is due, not only to the very large amount of humidity in the atmosphere, checking the evaporation of sensible and insensible perspiration, but also to the state of electrical disturbance that constantly exists in these latitudes. The feeling is, in fact, less one of actual heat than of a constant dampness, owing to the perspiration, which flows freely on the slightest exertion, not being carried off by the air as it would be in a dryer atmosphere. When on deck, and sitting perfectly still, it is possible to keep moderately cool; for even in the most complete calm the rolling of the vessel and the flapping of the sails produce a movement of the air which is very refreshing. But it is when driven below by the tropical rains or the necessities of eating or sleeping that the greatest discomfort is experienced.

Absolute calms are, however, rare; and, owing to their improved construction, it is but seldom that ships, now-a-days, lose their steerage-way. In airs so light that formerly the helm would have been lashed and the vessel left to her own devices, she will now move ahead at the rate of two or three knots an hour, often, apparently, only by the flapping of the sails. Even with daily runs of only fifty or sixty miles, this part of the voyage, however unpleasant it may be at the time, seldom, at the present day, lasts more than three or four days, or a week at the outside, whereas formerly it was not unusual for a ship to be becalmed in the "doldrums" for two or three weeks.

Although the oppressive weather of these latitudes must always be more or less trying to invalids, yet they generally get through it very fairly, and do not seem to suffer

any permanent harm from it. As for those who are fairly well, although they may lose weight a little and complain a great deal, yet their general health usually remains remarkably good; while those who suffer from rheumatism or derangements of the liver frequently derive considerable benefit from the profuse perspirations induced by this natural vapour-bath.

The tropical downpours of tepid fresh water often tempt both passengers and crew to indulge in a shower-bath of nature's own providing, and as many as fifty or sixty people may sometimes be seen skylarking about the decks at these times clad in the most airy costumes in lieu of bathing-dresses. Invalids had, however, better refrain from following this example.

The sailors collect the plentiful fresh water and indulge in grand washing operations, and sometimes the rain-water which flows down from the forecastle or the poop is collected to the extent of many hundreds of gallons and transferred to the ship's tanks.

After the requisite number of melting days and nights have been endured in passing through the doldrums, a squall of wind and rain, often accompanied by thunder and lightning, ushers in a pleasanter state of affairs. The variable airs drawing round to the south-east freshen into the eagerly expected *south-east trade winds.* The gloomy canopy of clouds rolls away, revealing the characteristic trade-wind sky with its small clouds, which vanish as you look at them; and under the influence of a cool and refreshing breeze, and the rapid movement of the ship, every one shakes off the languor of the equatorial calms.

The south-east trades are usually met with a little to the north of the equator. They are, as a rule, steadier, stronger, and of greater extent than the north-east trades. While

the latter occupy a belt of only from fifteen to twenty degrees of latitude, the former extend over from twenty to twenty-five degrees.

A glance at the map will show that the south-east trades are not so favourable in direction for an outward-bound ship as the north-east trades are; and a vessel is frequently compelled to sail a good deal to the west of her true course in order to avail herself of them to the full extent. The plan usually adopted is to sail as close to the wind as is consistent with keeping the sails full.

But, although to a certain extent head-winds, the south-east trades are so steady and strong that fine runs are made each day, and the captain strains every effort to make the most of them, and is exceedingly sorry when they come to an end.

The sky and sea present much the same aspect in both trade-wind regions. The same small detached clouds, bright skies, and crisp, curling waves are seen in both, but squalls accompanied by thunder and lightning are perhaps more frequent in the south-east than in the north-east trades. Both very often begin and end with these squalls.

The Calm-belt of Capricorn.—In the latitude of about 25° S. the outward-bound ship enters the region of light variable airs and calms known as the calms of Capricorn. The weather here is much the same as in the corresponding belt of Cancer in the northern hemisphere, except that, on the whole, it is cooler. For the invalid who is suffering from chest disease, and who likes warmth without oppressiveness, this will be found one of the most delightful portions of the voyage, the average temperature being from 68° to 70°.

Like the "horse latitudes" in the northern hemisphere, this calm-belt has not by any means well-defined limits, and sometimes the ship will pass through it without a check;

but in the majority of instances a few days of calms and light airs will be experienced in this neighbourhood.

Having reached a latitude of from 30° to 35° S., the ship enters the *southern region of prevailing westerly winds.* This arbitrary division of the ocean extends from the southern limits of the calms of Capricorn to the Polar seas, and a vessel proceeding to Australia will remain in it during the whole of the latter half of the voyage.

At first the winds are often light and variable, but as the ship pursues her south-easterly course and gets well to the south of the Cape of Good Hope, she meets with those strong breezes which have been called "the brave west winds of the southern hemisphere."

As the ship sails southwards the weather becomes colder and more bracing every day, until, when the extreme southern limits of her course have been reached, the temperature is almost that of winter in England.

In this part of the voyage the aspect of the sea is far more familiar than in the tropical latitudes, and often reminds one of the foaming waves around our own shores, especially as in this locality they are sometimes green, particularly when seen by transmitted light.

The principles of "great-circle sailing" have caused the captains of vessels to take a much more southerly route than they did before their discovery. They now sail as low as 45° or 50° S.;* and this they do for two reasons: first because by taking this route the actual distance to Australia is materially lessened, and secondly because, as a rule, the further south they go the stronger are the prevailing westerly winds.

A favourite latitude for running down the easting is

* Some of the "invalid" ships preserve a more northerly course in order to avoid the rough and cold weather experienced farther south.

about 46° S., and here all the characteristics of the "roaring forties," as they have been called, are abundantly exhibited. Maury thus describes this part of the ocean :—"The billows there lift themselves up in long ridges with deep hollows between them. They run high and fast, tossing their white caps aloft in the air, looking like the green hills of a rolling prairie capped with snow and chasing each other in sport. Still their march is stately and their roll majestic. The scenery among them is grand, and the Australian-bound trader, after doubling the Cape of Good Hope, finds herself followed for weeks at a time by these magnificent rolling swells driven and lashed by the 'brave west winds' furiously."

This kind of weather, accompanied by strong winds, generally more or less westerly in direction, together with a cold temperature, continues with scarcely any interruption until the vessel, approaching the Australian shores, runs somewhat suddenly into warmer and calmer weather.

It may be readily imagined that winds so boisterous and long-continued not unfrequently freshen into gales of considerable violence. As, however, the barometer usually gives due notice of their approach, every preparation can be made in good time, and their direction being generally favourable to the ship's course, she can run before them with as much sail set as it is wise to carry.

Sailors say of the gales experienced in these latitudes that "if they are rough they are honest," and they seem greatly to prefer them to the sudden cyclones and hurricanes in other parts of the world, which often give comparatively little notice of their approach, and veer so rapidly in direction that a ship is sometimes taken aback without any warning.

The gales off the Cape almost repay by their grandeur any inconvenience to which one may be subjected by them. When they last, as they sometimes do, for two or three

days at a time, the waves become grand beyond all description; and during the day-time, at least, when able to remain on deck to watch the magnificent spectacle of the vast towering waves, and to admire the wonderful manner in which the ship rides over them as they come sweeping onwards as if to crush her, the beholder is filled with a sense of exhilaration and delight that must be experienced in order to be understood.

It must be acknowledged, however, that during the night, or when the weather is so bad as to compel one to remain below, a gale is by no means a pleasant matter. The extraordinary and unexpected movements of the ship, the roaring of the wind and the sea, and the dashing of the waves against the ship's sides, not only tend to banish sleep, but also render it difficult to employ oneself in any way. The cabins, too, are made gloomy and dark by the closing of the dead-lights, and meals are only accomplished under considerable difficulties and in an incomplete manner.

All things considered, those who have once experienced a violent gale seldom wish to see another, and few are sorry if, as not unfrequently happens, the voyage is accomplished without encountering a single storm of any magnitude.

Although it is but rarely that other ships are met with in the more southern latitudes, yet these seas are by no means deserted, for they are tenanted by numberless sea-birds, from the tiny Mother Cary's chicken to the stately albatross, as well as by schools of porpoises and numerous whales of various kinds.

The reversal of the seasons in the southern hemisphere is, at first, somewhat perplexing. The voyager who leaves England in the late autumn will find as he travels southwards that the days do not at first draw out as rapidly as

he might have expected. In fact, as long as he is north of the line he will notice but little difference—the fact being that the sun is travelling southwards as well as the ship, and that the movement of the one almost compensates that of the other. But no sooner has the equator been passed than the days begin to lengthen with a rapidity that would astonish us if we did not remember that in the southern hemisphere the twenty-first of December is the *longest* instead of the shortest day. A Christmas spent in the South Atlantic seems, therefore, particularly strange to an inhabitant of the northern hemisphere, for although the weather may be as cold as it usually is at Christmas time in England, yet the days will be as long as they are with us at midsummer.

As before mentioned, the changes in the apparent time are very marked while running down the easting between the Cape and Australia, for as the winds are strong and favourable, and the degrees of longitude are narrow so far south, it is no unusual thing for a ship to run five or six degrees a day for several days in succession, causing a difference in the clock of from twenty to twenty-five minutes each day. While to the *west* of the meridian of Greenwich the ship's clock will, of course, be *slow* as compared with Greenwich time ; but to the *east* of that meridian it will be *fast*.

The mean temperature experienced in the region of prevailing westerly winds (in a latitude of about 45° S.) is seldom higher than from 45° to 47°, even in the summer months; and it will be at once seen that this is much colder weather than that met with in a corresponding latitude of the northern hemisphere, where the mean temperature would be some ten degrees higher. In point of fact, the whole of the southern hemisphere is colder than the

northern, and midsummer south of the Cape is often as cold as midwinter at the same latitude in the North Atlantic.

In the southern hemisphere it is the *north* wind that is the warm and rainy wind, and the south wind that is cold and dry; also the north-west wind is more frequent than the south-west—just the reverse in every respect of what is the case to the north of the line. A moment's reflection will suffice to explain this. The north wind comes from the hot moist equatorial regions, whereas the south wind comes from the Polar seas.

Between the Cape and Australia the prevailing winds, though generally more or less westerly, frequently veer from north-west to south-west, blowing usually for a few consecutive days from each of these quarters, and the difference in the weather produced by the polar and equatorial currents respectively, is most marked. With the latter the weather is 5° or 6° warmer than with the former, but on the other hand the north-west wind is almost always accompanied by rain.

The transition from the heat of the tropics to the cold bracing weather of the "roaring forties" is, as may be imagined, not only great but also comparatively sudden; and, it will be asked, "What effect does this change of temperature produce upon the invalids?" A favourable answer can, I think, be given to this question. Nervous invalids, as well as those suffering from a tendency to pulmonary disease, usually improve more during this part of the voyage than in any other; and at this time a marked increase of weight takes place, owing no doubt in a great measure to the improved appetite and vigour of digestion that result from the bracing climate of these southern latitudes.

The coldness of the weather not only necessitates the wearing of very warm clothing, but also renders

vigorous exercise both pleasant and desirable. In sailing vessels it is not always customary to warm either the saloon or the cabins by artificial means, and with the thermometer at 45° the passengers are sometimes glad to wrap themselves in their great coats and railway rugs even when sitting below. Long hours in bed become the rule, and when on deck both invalids and those in robust health are glad to tramp up and down for hours at a time in order to keep themselves warm; and, as may be imagined, the keen sea air and the vigorous exercise combined, tend to produce an enormous appetite.

During the four or five weeks that this kind of weather continues, I have known some of the younger invalids gain more than a stone in weight, and the improvement in their health and appearance has been perfectly astonishing.

Colds are very seldom caught in these latitudes (they are much more frequent in the tropics), and with moderate care the most delicate may be on deck for many hours in the course of the day.

Those who suffer from bronchitis are usually more affected by the cold than other pulmonary invalids, but even they almost always improve in their general health, although the cold may have a somewhat irritating effect upon the bronchial mucous-membrane.

The following extract from a diary kept during a voyage to Australia made in company with a very large number of invalids may serve to illustrate the effects of the climate of these southern regions :—

"The passengers, now near the end of their three months' voyage, present, with scarcely an exception, an appearance of rude—I may almost say full-blown—health that is quite ludicrous. Their faces are red and tanned and fat; and as for their bodies, it seems a marvel how in some cases their garments retain their buttons, so great is the strain upon them! Several 'invalids' have left off

waistcoats, being unable to make them meet, and one young fellow *says* that he measures eight inches more round the body than when he started. The improvement in the appearance of the ladies is quite as marked as in the case of the opposite sex. The costumes of all are as amusing as possible. On every side are seen nondescript and shapeless hats and caps, shabby and threadbare coats, torn unmentionables much bedaubed with tar and sadly in want of patching, boots burst out at the sides, or tattered canvas shoes. The ladies' dresses in some cases retain scarcely a vestige of their original colour, their hats are collapsed and shapeless, and some, who still have a lingering desire to preserve the delicacy of their hands, wear the most wonderful old gloves that can be conceived. As I watch the motley throng promenading the deck, I cannot help thinking what a sensation we should produce if we were all transported just as we are into Regent Street or the 'Row' at the most fashionable hour of the day."

CHAPTER VII.

MANAGEMENT OF THE HEALTH AT SEA.

The treatment of sea-sickness—Regulation of the diet—Exercise—Bathing—Ventilation of the cabin—Closet arrangements—Management of the health in the tropics—Sleeping on deck—Tropical colds—Ulcerated sore-throat—"Prickly heat"—Necessity of fresh air for invalids.

ONE of the earliest troubles of those unaccustomed to the sea will, of course, be *sea sickness.* I will therefore endeavour to offer a few practical suggestions that may prove of service to those who become victims to this much dreaded complaint.

First of all, the invalid must not fall into the error of looking upon sea-sickness as an unmitigated evil: on the contrary, it should rather be regarded as being, within moderate limits, decidedly beneficial, and an admirable preparation for receiving the full benefits of the sea voyage. Most unpleasant it doubtless always must be, but it is very seldom prejudicial to health, and even in those happily rare cases where people of unusual susceptibility (almost invariably ladies) suffer more or less from sea-sickness during the whole voyage, the constitution is seldom injuriously affected, and a week or two on land will restore the patient to more than usual health. Generally, however, sea-sickness only lasts from one to four or five days, although unusually rough weather will sometimes cause a slight return even late on in the voyage.

The following hints may be useful to sufferers :—

Try to bear the discomfort patiently as a necessary and unavoidable evil, and dismiss from your mind the idea that the ship's surgeon possesses any specific for its cure. Ice bags to the spine, chloroform, chloral hydrate, prussic acid, and all the numberless remedies that have been proposed, have been weighed in the balance of experience and found wanting. Some of them may relieve for a time, but they interfere with the natural course of the complaint, and do more harm than good in the long run. During the first violence of the attack the best thing to do is to retire to your berth and keep as quiet as possible. Do not encourage unnecessary retching, but on the contrary endeavour to control it by the exercise of the will. More can be done in this way than you may imagine. Get as much sleep as possible; but above all do not go too long without food. However much it may excite loathing at first, persevere in taking a little nourishment at intervals, if it be only a morsel of dry biscuit. When the stomach is much exhausted by sickness small quantities of stimulants, especially in an effervescing form, will be found of great service. The best stimulants to take are brandy in *very small* quantities, well diluted with soda-water, or dry champagne either alone or mixed with soda-water. When ice can be obtained it may, with very great advantage, be either taken with the fluids or allowed to dissolve in the mouth in small quantities at a time.

When the stomach is beginning to recover its tone, beef-tea perfectly free from fat (a difficult thing to obtain at sea), or better still, a solution of the Liebig's extract with which you have provided yourself, will be found most useful, especially if well seasoned with cayenne pepper. In fact, cayenne pepper appears at all times to exert a very beneficial effect upon the weakened mucous-membrane of the stomach, and I have often seen strong cayenne lozenges

more useful in allaying that uncomfortable feeling of nausea which sea-sickness leaves behind it, than almost any other remedy.

But, above all, directly you feel able to do so, if the weather be favourable, make your way on deck and remain in the open air as much as possible. Those who have sufficient determination to do this always make a much more rapid recovery than those who remain in their cabins. According to one theory sea-sickness is caused by the brain failing to understand the movements of the waves. If this should be true (which is however very doubtful), it would follow that there is much more opportunity for studying and comprehending the complex movements of the sea on deck than below. But whatever the *modus operandi*, the fact remains that the open air is wonderfully beneficial, and advantage should be taken of the first symptoms of returning energy and the first interval of fine weather to go on deck.

Finally, do not be discouraged if, for some mornings after the actual sickness has subsided, you feel much nausea and discomfort on first attempting to rise. Summon your resolution, get up, face breakfast boldly, and go on deck, feeling sure that in a few days this last vestige of your enemy will have disappeared.

Sea-sickness generally leaves behind it a good deal of constipation, and a few doses of some mild aperient medicine will usually be necessary in order to complete the cure.

Diet.—After the sea-sickness has subsided, a ravenous appetite will most probably set in, caused partly by the sea air and partly by the improvement in the digestive functions brought about by the sickness. This craving for food should not be indulged to its full extent, but should be kept well under restraint. The diet should also be chosen judiciously, with due regard to the kind of food

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that has been found to agree best on shore. Do not fall into the error of supposing that everything will agree with you because you are at sea. The digestion may be improved, but it will not lose its own peculiar idiosyncrasies. For instance, to some weak digestions pork always acts almost like an irritant poison; and even in the case of those with whom it agrees well as an occasional article of diet it can seldom be taken for several days in succession with impunity. I have seen quite an epidemic of indigestion occur on board ship when, after nothing but mutton had been put upon the table for a considerable time, a pig has been killed and fresh pork in many inviting forms has been added to the bill of fare.

Vary your diet as much as is practicable, and bear in mind that as the fresh vegetables and fruit so important to the maintenance of health cannot be obtained at sea, it is necessary to supply their place with the preserved vegetables, which are usually pretty freely supplied, and which form the best substitute that can be had.

With regard to stimulants, you will find, as a rule, that you will require less at sea than on shore, probably because the amount of exercise taken is so much less. If accustomed to beer, it may be taken in moderation during the cooler portions of the voyage; but as the bottled beers supplied on board ship are usually much more potent than ordinary draught ales and porter, they should be taken much more sparingly. In the tropics claret will be found by far the best beverage, and when diluted with lemonade or soda-water it is very useful in allaying the distressing thirst that is so often experienced during the hotter portions of the voyage.

All rules for the management of the diet at sea may be thus summarised. Be more moderate both in eating and drinking than you would be on shore.

Exercise.—One of the most serious drawbacks to the life on board ship, for those in health as well as for invalids, is the absence of any inducement to take sufficient exercise for the due maintenance of health. In the warm latitudes particularly, the temptation to sit still all day enjoying the luxuries of idleness is very great. The voracious appetite which most people have when at sea is, however, in itself a sufficient reason why this disinclination to exertion should not be indulged. However wearisome it may at first seem to pace systematically up and down the short limits of the poop or quarter-deck, I cannot too strongly urge perseverance in this respect. Set aside, each day, certain hours for exercise, and adhere to them whenever the weather is sufficiently fine. Walk for a certain time proportioned to your strength. By common consent the hour just before dinner seems to be fixed upon in most ships as the favourite time for promenading the decks, and this is a very good hour for one instalment of exercise; but it will always be better to take a second walk—in the evening during the hot weather, and in the forenoon during the cooler weather.

A good many miles may in this way be traversed in the course of the day, and the actual distance may, for curiosity's sake, be easily calculated by ascertaining the length of the deck and counting the number of turns taken. Passengers generally promenade in pairs, and sometimes the deck becomes quite crowded with walkers, especially in calm weather.

In the case of young men, the walking exercise may sometimes with advantage be supplemented by gentle and moderate practice with the dumb-bells, etc. The best time for this is in the morning, after the bath. Dumb-bells should, however, always be used in moderation by invalids, and never to the extent of producing muscular fatigue. I do not recommend invalids, especially those who suffer from

delicacy of the chest, to join in those violent athletic sports that are in vogue amongst the midshipmen and junior officers of most ships; neither should they indulge too freely in excursions aloft amongst the rigging. I have seen serious results follow over-violent exertion of this kind.

Bathing.—Most modern ships are provided with bath-rooms for the use of the passengers, but in old ships they are seldom found except in the "quarter-galleries" of the stern-cabins, where there are rudimentary shower-baths, which, however, seldom act properly, and when they do are only of use to the occupants of these cabins. Even in those ships which are best found in this respect the demand for baths in the hot weather generally far exceeds the supply. Some of the male passengers, therefore, usually go up when the decks are being washed, at five or six o'clock in the morning, and have recourse to the "wash-deck tub," or are played upon by the hose, or have buckets of water thrown upon them by the sailors.

This is, of course, too violent a form of bathing to be indulged in by those in delicate health, and I am inclined to think that total immersion even in an ordinary cold bath is often too great a shock for consumptive invalids. It has, therefore, been recommended, when speaking of the outfit, that, where practicable, a small bath should be provided by the passenger himself for use in his own cabin. If desired to do so, the cuddy-servants will bring down one or more buckets of sea-water every morning, and in this way the safe and invigorating luxury of a sponge bath can be indulged in at your own time. After rubbing dry it will be found of great advantage to employ brisk friction with horsehair gloves or a hard flesh-brush for about ten minutes. This not only acts most beneficially upon the skin, but also removes any saline particles that may have been left behind by the sea-water, and which will other-

wise produce a very unpleasant feeling of stickiness in hot weather.

In the tropics it will often be found desirable, in addi tion to the morning bath, to sponge the body, especially the chest and back, with *fresh* water (if it can be obtained) just before retiring to rest at night. A small quantity is sufficient for this purpose; and if there is a tendency to profuse perspiration during sleep, a litle vinegar may with great advantage be added to the water.

Ventilation of the Cabin, etc.—The number of cubic feet of air contained in an ordinary sleeping cabin on board ship would, unless constantly renewed, be quite inadequate to the requirements of healthy respiration even for one person. It will therefore be noticed that ventilators are freely introduced in those sides of the cabin which adjoin the saloon. But although these may be sufficient to ensure a renewal of the air during the cooler weather, such will not be the case in the tropics. Here it will be found that unless a constant current of air passes *through* the cabin it will soon become close and uncomfortable, and the health will be liable to suffer. Fortunately, during this part of the voyage the weather is usually sufficiently calm to allow of the ports being kept almost constantly open, especially in the case of the upper cabins in poop ships; and in this way the atmosphere of the cabin may be kept fairly pure by the current of air passing between the window and the ventilators.

Do not be afraid of sleeping with the port open when the weather is warm,—the night air will do far less harm than a vitiated atmosphere,—but at the same time, avoid sleeping in a thorough draught. The head can easily be protected by means of a curtain, and the port need only be sufficiently open to ensure ventilation without too much draught.

Sometimes, however, owing to bad weather, it will be necessary to keep the ports closed; and this is one of the most trying things that can happen while in the tropics. It is now that a curtain for the doorway will be found of the greatest advantage. By this means the cabin door may be left open even at night, and as the saloon skylights are only closed during very bad weather indeed, the sleeping-cabins receive the benefit of whatever fresh air enters the saloon.

Whenever the officers advise or order the ports to be closed, the passenger should on no account be tempted to re-open them until permission is given to do so, for the inconveniences of getting a sea into the cabin are far greater than the temporary deprivation of fresh air. The berths are often partly under the ports, and if once the bedding becomes wet with salt water it is most difficult to get it dry again. Added to this, if the cabin itself becomes thoroughly soaked by a sea, it takes many days, in the steamy regions of the tropics, before it dries again, and in the meantime it is pervaded by a damp, mouldy atmosphere which is not only unpleasant but unwholesome.

In Government emigrant ships the undesirableness of washing the decks when the air is loaded with moisture is fully recognized, and they are ordered either to be dry-rubbed instead of being washed, or if washed are to be carefully dried by means of hot sand and stoves specially provided for the purpose. In passenger vessels, however, these precautions are much neglected; and very often the stewards take advantage of a tropical downpour (which, though it loads the atmosphere with moisture, provides them with rain-water) to wash not only the saloon decks but also those of the various cabins. For my own part, I have always raised a vigorous protest against this proceeding as regarded my own cabin, and have insisted upon the washing being deferred to a bright and dry day.

The dampness of a ship's cabin, even under favourable circumstances, is shown by the condition of all leather articles at the end of a voyage. Portmanteaux, boots, and gloves become mouldy or mildewed, unless they are kept in tin or other damp-proof cases and so excluded from the air. It may be mentioned, however, that (except in the case of gloves) leather does not suffer in any way from a coating of mould, which, when cleared off at the end of the voyage, leaves the surface quite uninjured. Kid gloves should always be kept in tin boxes. Woollen clothes sometimes suffer from the damp. They should be taken out and dried in the sun two or three times during the voyage.

It must not be imagined, however, that the dampness of a cabin on board ship is as serious a matter as a damp room on shore would be. Owing perhaps to some peculiarity of the sea-climate, it seldom produces colds or other ailments, and, in a properly ventilated passenger-ship, it is generally unpleasant rather than injurious. At the same time, it is desirable to keep all immediate personal surroundings as dry as possible; and for this purpose, at intervals during the whole voyage, but more particularly during the hot weather, the cabin-servant should be desired to take the whole of the bedding on deck for the purpose of thoroughly drying and airing it in the sun. This is a matter that should be carefully looked to, especially by invalids.

The arrangement of the *closets* on board most sailing vessels is far from satisfactory. It is customary for each saloon cabin to contain an open closet with water laid on from the deck tanks. The stern cabins are the only exceptions. In these the closet is generally in the quarter-gallery, which being enclosed and having a separate ventilation, forms a far preferable arrangement. In the more modern ships general closets are provided for the male passengers, and when this is the case the closets

in the cabins should on no account be used by them except in the case of illness. In hot weather especially, the cabin closets are apt to become offensive unless they are used with great care. They are usually freely supplied with water from the tanks on the poop, and advantage should be taken of this to flush them thoroughly once or twice a day. Chloride of lime (so called), or better still, carbolic-acid powder, should also be freely used. A large quantity of these disinfectants is put on board every passenger ship, and they can be obtained on application to the surgeon. In some new sailing vessels an enclosed closet with separate ventilation is attached to each cabin; while in steamers there is generally one closet to each group of two or three cabins. Deck closets are however in my opinion preferable to all others for the use of male passengers.

The Tropics.—While speaking of bathing, ventilation, and other matters, I have already incidentally touched upon several points which may with advantage be borne in mind by the invalid while passing through the tropics, but there still remain a few special hints which may be found of service.

With regard to clothing, as it has been elsewhere remarked, it is at all times better to be overclothed when at sea than underclothed. In the tropics this is particularly the case, for tropical colds are not only severe, but easily caught, and although they do not usually leave behind them any permanent ill effects, yet, partaking as they do of the nature of influenza, they are very weakening at the time. I cannot too strongly urge the importance of wearing *woollen* clothing, however thin, during the hot weather; it is not only far more wholesome than linen, but also *actually cooler.* For the day-time, a thin woollen gauze under-waistcoat, a flannel shirt, and thin woollen trousers,

should be worn; the rest of the costume may be of any description that is most conducive to comfort. The nights, which being spent in the cabin, are by far the most trying portion of the twenty-four hours, may be rendered much more bearable by allowing nothing but woollen materials to come in contact with the body. Sheets should be entirely discarded during the warmer portions of the voyage. A horsehair mattress with a blanket laid smoothly upon it, will be found the most comfortable couch, and if provided with the thin flannel sleeping shirt and loose pyjamas, which have been previously recommended, all other covering may be dispensed with. Only those who have tried this way of sleeping in hot weather know how far preferable it is to any other. Even the linen covering of the pillow is uncomfortable, and a piece of thin Indian matting may with advantage be placed between it and the head. It is as well to keep a thin woollen covering, such as a shawl, at hand in case of feeling chilly towards morning.

The fresh yet genial air of the tropical nights presents many inducements towards *sleeping on deck;* and sometimes a dozen or more prostrate forms may be seen dotted about, lying on mattresses and wrapped in railway rugs. To those in robust health this way of sleeping is a great luxury, as I know of no sensation more pleasurable than on waking in the middle of a bright tropical night to feel the pure cool air fanning one's cheek, to see the stars glittering overhead, and to listen to the lazy flap of the sails against the rigging until all is lost again in the oblivion of sleep. But, even for the robust, sleeping on deck has its drawbacks, for sometimes a tropical squall comes on, and then the sleepers present an absurd spectacle when, aroused by the pattering rain, they stagger off with their mattresses to take refuge in the saloon or in their own cabins. Even when undisturbed by squalls, all deck

sleepers are aroused betimes by the sailors, who come without ceremony to wash the decks at about five o'clock in the morning. All this is very well for those in strong health, but invalids, especially those with any affection of the chest, must on no account allow themselves to be tempted to sleep on deck. The heavy dew, and the possibility of being soaked by passing showers, etc., are in themselves sufficient reasons against doing so, without reckoning the liability to disturbance from all kinds of causes.

Sometimes a whole colony of sleepers may be seen established upon the saloon table under the open skylights, but except in extreme cases of suffering from heat, all these irregularities are best avoided by the invalid, who, with an open port and door, will generally find his own cabin bearable, and more conducive to sound and undisturbed sleep than any other locality.

There are several little ailments which in the tropics sometimes make their appearance in almost an epidemic form. One of these is the tropical cold before alluded to, and which seems to be a kind of influenza. It is generally confined to the mucous membrane of the nose and throat, but is sometimes accompanied by a troublesome cough. It usually subsides at the end of two or three days, and is best treated by means of diaphoretics and salines.

A kind of ulcerated sore throat, which looks a good deal worse than it is, sometimes makes its appearance. It arises from relaxation, and a few doses of the solution of perchloride of iron, together with one or two local applications of the same to the tonsils and the back of the throat, will generally effect a complete cure.

An eruption of the skin peculiar to warm climates, and popularly known as "prickly heat," may make its appearance, especially amongst the children. It is a very troublesome affection, accompanied by intense itching,

and in severe cases it produces a crop of suppurating heads resembling small boils. Effervescing salines such as the so-called citrate of magnesia will be found of service internally, while externally a lotion of glycerine and water may be used; or olive oil applied with a feather will sometimes relieve the itching.

In conclusion, I cannot too strongly urge upon invalids the importance of being as much as possible in the open air, if they wish to derive full benefit from their voyage. The air on deck is pure and health-giving; that of the saloon and cabins always more or less vitiated, and seldom so good as in a well-arranged house on shore. Hence, except for the necessities of eating and sleeping, all the time should be spent out of the cabins. If there is any kind of shelter on deck, such as a smoking-room or deck-house, even rainy or rough weather should not drive an invalid below. In the colder parts of the voyage he should clothe himself warmly, and remain on deck as many hours as possible, keeping up the circulation by frequent exercise. In some cases, however, it will be well to avoid the night air in the cold weather.

When compelled to remain below, every possible means should be taken to keep the cabin fresh and well ventilated, and it should always be remembered that too much air is better than too little.

CHAPTER VIII.

OCCUPATIONS AND AMUSEMENTS AT SEA.

Agreement of passengers amongst themselves—Reading—Open-air games —Quoits—Cricket—"Bull-board"—Shooting sea-birds—Athletic sports—Dancing—Theatricals, concerts, etc.—Newspapers—Chess tournaments—Sailors' amusements—Crossing the line—"Burying the dead horse"—Sailors' songs—Glimpses of land—Speaking passing ships—Sending home letters—Excursions in the ship's boats.

ANY one starting upon a voyage the monotony of which will for months be unbroken by letters, newspapers, or visits from friends, and in the course of which it is quite possible that not even a passing glimpse of land may be obtained, naturally asks himself what sources of amusement and occupation will be open to him, to prevent his falling a victim to that *ennui* which to some minds is almost as bad as, and indeed sometimes directly productive of, ill-health itself. But although, as a general rule, nothing very exciting is to be looked for on board ship, yet a well-balanced mind ought not, I think, to find a sea life insufferably dull. To those who have an eye for the wonders and beauties of Nature, objects of interest in sea and sky are daily and hourly presenting themselves; while, if the passengers themselves possess a fair amount of vivacity and enterprise, there will be no lack of amusement even within the limits of their little floating community.

And here it may be as well to refer very briefly to a matter of great difficulty and delicacy—viz., the agreement

of passengers amongst themselves. Probably no mode of life has so great a tendency to bring into prominence whatever is weak or little in a character as the life on board ship. The conditions are all peculiar; and the want of usual occupations, the enforced association, and the tedium and monotony of the voyage, are all factors tending to destroy the balance of even the best regulated minds.

The late Canon Kingsley has, however, written much more forcibly on this point than I can hope to do. He says:* "We see in travel but the outside of people, and as we know nothing of their inner history, and little usually of their antecedents, the pictures we might sketch of them would be probably as untruthfully as rashly drawn. Crushed together too, perforce, against each other, people are apt on board ship to make little hasty confidences—to show unawares little weaknesses, which should be forgotten all round the moment they step on shore and return to something like a normal state of society. The wisest and most humane rule for a traveller towards his companions is to

'Be to their faults a little blind,
Be to their virtues very kind,'

and to consider all that is said and done on board ship like what passes among the members of a club, as on the whole private and confidential."

Reserving for a future chapter some little description of such objects of interest at sea as are connected with Natural History, I will now endeavour to say a few words about those amusements and occupations which are available on board most passenger ships.

First and foremost comes reading, for which a long sea voyage presents unusual facilities. If each passenger provides himself with a few books, a fair variety may obtained by circulating and exchanging the stock of s ere

* "At Last," by Charles Kingsley.

This course, however, should not be taken with works that are of much value to the owner, as books have a great tendency mysteriously to disappear on board ship.

Those who expect to be able to *study* in the sense of reading hard will almost always be disappointed. There is something in a sea life that seems to be antagonistic to work of this kind, and it is generally seen that those who started with high resolves in this respect very soon subside into light literature or idleness. There are of course exceptions, but they are rare. The prevailing inability to study is, however, scarcely to be regretted in the case of invalids, who cannot do better than provide themselves with a supply of light literature, and direct all their energies towards deriving the greatest possible benefit from their voyage.

There are several open-air games which can be played on board ship, and which furnish a capital means of obtaining that exercise, the want of which is one of the drawbacks of being shut up within such narrow limits.

Of these, one of the most universal is a modification of the game of quoits. The quoits are made by the sailors, and consist of circles of stout rope about six inches in diameter. Each player has two quoits, and there are several ways of playing the game. One of the most usual is to throw from a given distance at a dot chalked on the deck, which takes the place of the peg in the original game. The two quoits that are nearest the mark each score one, unless one of them is directly over the dot, in which case it scores three. A great point in the game as played on board ship is to attempt to drive an adversary's moit from an advantageous position. It requires some litt skill to allow properly for the force of the wind and A. ll of the ship; and a good match between champion matte always excites a great deal of interest. Other

modifications of the game ar ing into circles with numbered divisions; endeavo to throw the quoit over an upright wooden peg fi in a stand; and (in rough weather) throwing the quo s into a bucket placed at some little distance from the player.

A good deal of exercise and considerable amusement may be obtained by playing cricket, with such modifications as are necessary to adapt it to a ship's deck. The single-wicket game is the one usually played, and the wicket is fixed on a wooden stand, but has loose bales. As the balls are necessarily very frequently lost overboard, they are made by the sailors of "spun yarn," and are supplied to the passengers at so much a dozen. The bats are generally either roughly made by the players themselves, or are supplied by the carpenter. Much amusement is caused by the strange localities into which the ball is sent, and by the difficulty of making the runs if there is much sea on at the time.

Another game sometimes played on board ship is called "bull-board." It consists of a sloping board marked off into nine divisions, all of which are numbered except the two upper corner ones, which have a bull's head painted upon them. The players are provided with flat pieces of lead covered with leather, and these they throw upon the board, standing at a distance of a few feet. Each player has four throws, and his score is reckoned according to the value of the squares upon which leads pitch. Any lead, however, pitching upon either The the squares marked with a bull's head, deducts ten fi n is the score. Lea lying upon a line do not count. er ato

The number of sea birds which, in some parts ncy, voyage, constantly follow the ship, prove a g we. The ment to passengers with sporting tastes to t of games of their guns and rifles. But as it is alı ent. Where

possible to obtain the birds that have been shot, this form of sport cannot but be regarded by most people in the light of a cruel and useless destruction of life. For this reason some captains will not allow shot to be used,—permitting the guns to be loaded with bullets only, which, while furnishing a far better test of skill, do comparatively little execution. When a bird is hit, it is but seldom killed outright, and it is always sad to see it floating away astern with a broken wing or leg, to be pecked to death by other birds, or perhaps to linger on in agony for hours or days.

When once the passion for shooting has set in amongst the passengers who possess fire-arms, the perseverance with which they aim at everything, animate and inanimate, is truly surprising. Empty bottles or tins are thrown overboard, or are towed astern, to act as targets for rifles and revolvers. The motion of the ship and of the sea combined make it very difficult to hit these floating objects. I have seen a large target made from the head of a cask and suspended from the yard-arm, and as this follows the movements of the ship, it answers very fairly for rifle shooting.

In the evenings, when the weather is fine, the midshipmen and those whose tastes incline in that direction frequently indulge in athletic sports of various kinds, such as jumping, boxing, singlestick, as well as various strange games and feats of agility such as one sees only on board ship. Some of the more adventurous passengers are on occasions tempted to make excursions in the rigging; those who have not been aloft before must bear in mind that they are liable to be lashed to the rigging by [illegible] until they have paid, or promised to pay, their [illegible]ll of the ship, the price of a bottle of rum.

[illegible] evenings, too, there is sometimes dancing

on the poop, to the strains of a violin, piano, or any other musical instrument that may happen to be forthcoming; and the impromptu dance is perhaps kept up by the light of the tropical moon until a comparatively late hour.

But many of the amusements on board ship require more organization than those which have been already enumerated; and the plan adopted with regard to these, where there are a sufficient number of passengers to render it practicable, is to convene a meeting soon after the commencement of the voyage, and to form an "amusement committee," which in its turn may appoint dramatic, literary, and musical sub-committees, to get up amateur theatricals, concerts, negro entertainments, mock trials, etc., and, in the case of the literary department, to start and keep up a newspaper or magazine. The latter, if well managed and kept free from offensive personalities, causes great interest and amusement, and often brings out unexpected talent. The newspaper is generally issued weekly, and is, of course, in manuscript. If there are artists amongst the passengers, its interest is much increased by the addition of illustrations. At the end of the passage the newspapers are frequently printed in the form of a pamphlet, and form a capital souvenir of the voyage.

Chess and draughts, always favourite games on board ship, are made of more general interest by being played in the form of a "tournament." The rules for chess tournaments vary, but the usual plan is for each member of the tournament to play three games with every other member, the players having been previously divided into classes and handicapped according to their proficiency, the upper classes giving various pieces to the lower. The player who wins the greatest total number of games is of course the champion of the tournament. Where

there are a good many players the tournament lasts for several days, and becomes very interesting towards its close.

If there is any one on board who is competent to give instruction in foreign languages, and who does not mind the trouble, French or German classes may with much advantage be formed amongst the passengers. Capital progress is sometimes made in this way, as a feeling of rivalry springs up which keeps the pupils up to their work at any rate for a time, although, like everything else entailing exertion either of body or mind, such classes are apt to die a natural death under the enervating influences of the warmer latitudes.

The introduction of spelling-bees or of geographical or grammatical bees, though they are now obsolete on shore, will, if properly managed, make an agreeable variety in the amusements of a long voyage.

Card playing is of course a great resource on board ship, especially during those evenings when the state of the weather or of the temperature prevents the passengers being on deck. One or two whist parties are generally formed, while others play bézique, loo, cribbage, etc. Unfortunately, however, card playing but too frequently leads to gambling, and considerable sums of money that can but ill be spared often change hands during a voyage.

Another evil incidental to ship life is the practice of betting upon almost everything. Thus the day's run of the ship, the date of passing various points in the journey, the day and hour of arrival in port, as well as the various games that are played, all form excuses for bets and sweepstakes amongst those who find a difficulty in employing their time in a more sensible manner. Bets have even been made upon the order of appearance at the breakfast table of habitual late risers!

There are one or two time-honoured customs amongst

sailors which furnish a good deal of amusement to the passengers.

One of these—the ancient drama attendant upon crossing the line—is now very properly discouraged by most captains, and is rapidly falling into disuse, but it still survives in old-fashioned ships.

Although "crossing the line" has been described numberless times, the following account from a lady's diary may prove interesting to any readers who may not happen to have seen these descriptions :—

"On Saturday, the 9th November, we crossed the line. It was a day of great festivity among the sailors, and from morning to night all kinds of amusements were carried on on board.

"They commenced on Friday night by Neptune's secretary coming on deck and delivering letters from 'His Majesty the King of the Seas' to our captain. One of the sailors was dressed up to represent the character, and it was most amusing to see the grave manner in which the skipper carried on a conversation with this individual. His inquiries for Neptune, his Queen, and family were gone through with the utmost decorum, and he ended by saying, 'You must give my respects to his Majesty, and say that I shall be prepared to receive him on board to-morrow and swear allegiance to him as Monarch of the Seas.' Then the secretary took his leave, and our letters were distributed.

"The next day at the appointed time Neptune, accompanied by his satellites, appeared on board. He certainly seemed more hair than anything else, but that no doubt was correct. The Queen was too modern to be in character. She had a huge chignon of yellow tow, and was less careful in her deportment than might have been expected from a person in her dignified position. Their son was decidedly the best of the three. He looked really capital. He was

painted a dark yellowish-red, with all kinds of mystic emblems in black on his face and body. His only clothing was a brilliant striped cloth round his loins and a silver (?) crown on his head. Round these principal personages were grouped several droll characters, representing a doctor and barber, with their attendants.

"Neptune and his train came on the poop-deck, where they were received by the captain with all due honours. After this ceremony they went on the quarter-deck, and the barber, who had an enormous razor, shaved various passengers who had not before crossed the line. They were then put into the bath and had a good ducking. All this was carried on with perfect good humour, only willing victims being sacrificed. Then Neptune took his departure, amidst great cheering.

"The afternoon was devoted to sports of various kinds —a prize of money being given to successful candidates. The most interesting was a race to the mast-head and back, a prize of 10*s*. being given by the first mate. It was won by a Dutch sailor, who performed the feat in two minutes five seconds; this, the captain told us, was remarkably quick work.

"There was also a smoking race, a prize being awarded to the man who could get through a quarter of an ounce of tobacco in the shortest time. In the evening a grand concert was given, the captain having offered a prize for the best song. The quarter-deck was lighted up for the occasion, and some men blacked their faces and came out as Christy Minstrels. Their 'get up' was capital, and they gave us some really good songs. I expect that the glorious night we had, with the moon so bright that one could easily read by it, had much to do with the affair going off so well.

"So the day came to an end, and a very jolly day it was."

The ceremony known as "burying the dead horse" is a curious one, and is still practised in a good many Australian ships. It takes place during the outward voyage, on the twenty-eighth day after departure from port, and seems to have a double signification. Sailors, before they join their ship, have an advance note given them for a month's wages. This they usually spend, therefore the first month they may be said to be earning no wages. They therefore symbolise the first month's work by the *dead horse*, and speak of it as "working the dead horse." The second signification seems to have to do with the probable position of the ship at the end of the month, for by this time she is likely to be in the "horse latitudes" (calms of Cancer).*

The following is a description of the "burial of the dead horse" as it took place in one of Messrs. Wigram's ships:—

"In the morning we were called upon for contributions, and about £7 was collected. At tea time a bell was rung, and a crier announced in different parts of the ship that the dead horse would be sold by auction at eight o'clock the same evening, prefacing his proclamation with 'O yez! O yez! O yez!' and ending up with 'God save the Queen.'

"By eight o'clock all the passengers and officers were assembled on the poop, and the second and third class passengers on the quarter-deck, making altogether quite a crowd. Presently we heard a dismal chant proceeding from the forecastle, consisting of a solo and chorus, one of the refrains being 'Poor old horse.' Gradually the sounds drew nearer, and a procession was revealed, headed by a groom with a halter and two policemen. A number of other characters in various costumes next appeared, drawing after them the effigy of a horse of very peculiar construction, but not by any means a dead one, to judge by his prancing legs. On his back was a man dressed in a

* See page 64.

white dress-coat and a white hat, with his face blackened and riding vigorously. Following, were two men armed with sticks, with which from time to time they dealt resounding blows upon the hind-quarters of the horse.

"After making the tour of the main deck, the procession stopped in front of the poop, and then the auctioneer (the cook), dressed in racecourse costume, took his stand upon a barrel, and, assisted by his two clerks, proceeded to sell the horse, after making a very humorous speech as to its merits and pedigree, symbolical throughout of the ship and the men's work. The passengers on the poop made successive bids up to £7 10*s*., at which price the horse was knocked down, the auctioneer using as a hammer a gigantic mallet.

"Then came the most curious part of the performance. The horse *with the man on his back* was hauled bodily up, from the deck to the mainyard arm, illuminated during his ascent by blue lights burnt on the yard. The appearance was most peculiar, as the ropes were not visible, and the horse and his rider seemed to be suspended in mid-air over the foaming sea, which looked very grand in the strange blue light. As soon as the yard-arm was reached, the rider detached the horse from the line, and it fell with a great splash into the seething water beneath. The man was then hauled down upon deck with a blue light burning in his hand, and after hearty cheers for the captain, the officers, the ladies, and the Prince of Wales (whose birthday it was), the performance terminated."

Amongst the first things to attract the attention of a landsman going to sea for the first time will be the songs, or, as they are sometimes called, "chanties," of the sailors. The men in most ships indulge in these songs on every possible occasion, but it is when hauling up the topsails after a gale, or when heaving up the anchor on starting

upon the homeward voyage, that they sing with the greatest vigour. Many of the songs are said to be ancient, and to have been handed down from remote generations of sailors. They nearly all consist of a solo alternating with a chorus, which, being very short and recurring between each line of the solo, serves to mark the point at which all the men pull together. To the uninitiated, it seems as if there were a vast amount of singing in proportion to the work done. Many of the songs are in a minor key, and most of them are quaint and "taking," and when heard either amidst the roaring of a gale or in the stillness of night, they have a wild and impressive effect. The words of the "chanties" will seldom repay investigation, as they are seldom fit for ears polite, and when not coarse are generally nonsensical, and not unfrequently more or less improvised for the occasion. Occasionally popular land songs are adopted by the sailors, but they never seem so suitable, nor do they "go" as well, as the original time-honoured ditties.

It is, however, in objects external to their floating home that those who "go down to the sea in ships" will find most to interest and amuse them; and perhaps nothing is so eagerly looked for, after the first week or two spent at sea, as land—even if it be only a passing glimpse of some island or barren rock lying near the ship's course. On the outward passage to Australia it occasionally happens that land is never sighted at all, from the commencement of the voyage to its termination. Sometimes, on the other hand, land is seen five or six times, or even oftener.

After leaving Plymouth, if the wind is contrary, it is not unusual to obtain frequent glimpses of the Cornish coast, or of the coast of France, while beating out of the Channel.

Then comes a long stretch of ocean, which may pos-

sibly, though not very probably, be broken at the end of ten days or a fortnight by a distant view of Madeira.

The next land likely to be seen will be one or more of the Canary Islands—Ferro or Palma, the two most westerly of the group, being those that are most frequently sighted by outward-bound ships; but occasionally the Peak of Teneriffe, which under favourable circumstances is said to be visible at a distance of seventy or eighty miles, may be seen towering into the sky.

The Cape Verds, which are situated off the extreme west point of the African continent, are perhaps the oftenest sighted of any of the groups of islands lying near the outward track of sailing vessels; and as they consist for the most part of high mountainous land of volcanic origin, they come into view at a considerable distance. S. Antonio, the most westerly of the group, is the one most frequently seen by sailing ships, but steamers generally pass to the east of the islands, between them and the African coast.

The Islands of Ascension and St. Helena are out of the usual track of outward-bound ships; but if driven much to the west by the S.E. trades, the solitary island of Trinidad may possibly be sighted, in lat. 20° 30′ S., long. 29° 10′ W. It is a mere barren rock, inhabited by myriads of sea-birds, especially Soland geese. The Portuguese at one time attempted to establish a penal settlement there, but it was soon found unsuitable for the purpose. This Trinidad must not be confounded with the larger island of the same name belonging to the West Indian group.

A distant view is sometimes obtained of another barren island of the South Atlantic,—viz., Tristan d'Acunha, which lies in lat. 37° 6′ S., long. 77° 2′ E. From this point the track of an outward-bound sailing ship lies through a long waste of ocean, which stretches as far as the shores of Australia, almost without a break in its vast expanse. The Crozet Islands lie to the south of the usual course, and the

only land at all likely to be seen after passing the Cape of Good Hope will be the two small volcanic islands of St. Paul and Amsterdam, in lat. 38° S., long. 77° 48′ E.; but it is usually thought expedient to give these a tolerably wide berth.

Next to the chance of seeing land, nothing excites more interest at sea than passing vessels.

The number of ships met with during a voyage to Australia varies greatly. I have heard of cases in which not a single sail has been seen between the English Channel and Port Phillip Heads. But these were quite exceptional instances, and usually a large number of vessels are passed, although not so many now as before the opening of the Suez Canal, for then the Atlantic was the great highway to India and China as well as to Australia.

The greatest number of ships are usually met with in the tropics, where the tracks of outward-bound and homeward-bound vessels cross each other.

Although sighting a ship is at all times a matter of interest, it is in those localities where but few are seen, and where the loneliness of the ocean is most felt, that the greatest impression is produced.

Whether the approaching vessel is outward or homeward bound (sometimes difficult to decide); what are her rig and tonnage; to what nationality she belongs; and whether she will come near enough to speak, are all questions which excite much discussion and surmise. As she approaches all glasses are brought to bear upon her, and any sign of hoisting signals is carefully noted.

The order of signalling is as follows: First the ensign is hoisted—the etiquette being that the smaller vessel should take the initiative. This being interpreted means, "I belong to such a nation; what is *your* nationality?" Then the other vessel hoists her ensign in reply. Of course, in the case of an English merchantman the ensign

is the Union Jack without the St. George's cross, which is used only by men-of-war. The next proceeding is for the first ship to hoist her "number"—that is a combination of flags that signifies her name. In the "Commercial Code of Signals," which is now almost universally in use, there is a flag for every letter of the alphabet except x, y, z, and the vowels. Every captain is furnished with a list in which the combination of letters which constitutes each ship's number is placed opposite her name, together with her tonnage and other particulars. When the number has been responded to by the answering ship, the first ship hoists a combination of flags which stands for the port from which she has sailed; then another signifying the port to which she is bound; next the number of days out—which, when a ship has made a slow voyage, is sometimes reduced to smaller limits than are quite compatible with truth. After this, flags are hoisted which signify "all well on board"—if such is the case—and, in the case of an outward-bound English ship, "Please report me at Lloyd's," if it is wished that tidings should reach the owners. Questions on other subjects are sometimes asked and answered—such as the kind of weather that has been experienced, the point at which the trade winds have been picked up or lost, or the exact time by the ship's chronometers. The latter is communicated in a very ingenious manner, but the method would take too long to describe here.

Finally the ensign is dipped three times as a parting salute, signifying "We wish you a pleasant voyage," and then each of the ships goes on her way. Of course, the whole of this routine is not gone through with every ship that is spoken; and indeed there is often time only to hoist the ensign or the number while passing; and some ships are churlish or lazy, and take no notice of signals.

But it is when meeting a homeward-bound ship in a calm, after many weeks spent at sea, that the greatest excitement prevails amongst the passengers, because then there is a chance of sending letters home; although in these days of clipper-ships, which move at the rate of two or three knots an hour in the lightest airs, the opportunity occurs far less frequently than in former days.

As the two vessels almost imperceptibly near one another, every eye is strained to discover the nationality and probable destination of the approaching ship, and as soon as the slightest probability of sending letters by her is discerned, every passenger falls to writing letters with frantic haste, except perhaps such wiser spirits as have adopted the precaution of writing a sort of journal letter day by day, ready for such an opportunity.

A canvas bag, upon which the name of the ship has been painted, is usually provided for the reception of the letters, which, as they are written, are dropped into it up to the last moment, when the sail-maker sews it up securely. In the meantime a boat has been lowered, and is manned by a crew under the command of one of the officers of the ship. A present of some kind, such as potatoes or flour, is put into the boat, together with the latest newspapers from England, and finally the bag of letters is lowered into her, and she departs on her errand eagerly watched by all on board. Presently the homeward-bound ship is reached, and the officer, together with any of the passengers who may have accompanied him, climb up her side and are lost to view, while the men remain in the boat and exchange ideas with the sailors who look down upon them from the bulwarks above. It is surprising how quickly, even when it is apparently almost a dead calm, the combined progression of the two vessels carries them away from each other; and when the visitors come over the side to regain their

boat they often find they have quite a long pull before them in order to reach their own ship. They usually bring with them a return present—generally some produce of the country from which the ship has sailed, such as preserves, pickles, etc. On their arrival they are surrounded by a crowd of eager questioners, all anxious to know full particulars with reference to the captain, crew, and internal arrangements of the vessel they have visited.

Ships' letters are posted unpaid at the port of arrival, whether it be in England or on the Continent, and are charged the ordinary rates of postage on delivery—not double, as in the case of other unpaid letters.

During a dead calm a good-natured skipper will sometimes allow one or more of the boats to be lowered, in order to permit the passengers to enjoy the novel sensation of looking at their floating home from the outside, while they exercise their muscles with a little rowing.

Sometimes, too, the younger men, on finding themselves at a considerable distance from the ship, indulge in a bathe, although this is at all times a hazardous proceeding, especially in the tropics, where sharks abound. During a voyage to Australia the author once saw two sharks prowling about between the ship and a boat from which a party of young men were bathing, and it was with some difficulty that the absentees were apprised of their danger.

CHAPTER IX.

OBJECTS OF INTEREST AT SEA.

Colour of the sea—Waves—The southern constellations—Auroras—Shooting-stars and meteors—Lunar coronas and haloes—Water spouts—Sunsets at sea—Vertical sun—Living creatures of the sea—Whales—The Greenland whale—Finbacks—The sperm whale—Food of whales—The enemies of the whale—Dolphins and porpoises—Sharks—Pilot-fish—Catching a shark—Saw-fish and sword-fish—The bonito—Barracouta—Flying-fish—Turtles—Lower forms of marine life—Capturing crustacea, jelly-fish, etc.—"Portuguese man-of-war"—Mode of obtaining microscopical objects—The phosphorescence of the sea—Sea-birds—Mother Cary's chicken—Soland-goose—The albatross—Sea-birds south of the Cape; their number and variety—Cape-hen—Mutton-bird—Boatswain-bird—Whale-bird.

IN endeavouring to give a brief account of some of the objects of interest in sea, sky and air, met with during a voyage to Australia, no attempt will be made to enter into anything like minute scientific details, which would be not only beyond the powers of the writer, but also foreign to the scope of this little work. All that will be attempted is to describe such things as are usually seen just as they would strike a non-scientific observer who yet is interested in what comes under his notice.

One of the first things external to the ship that is likely to arrest the attention of any one taking a voyage for the first time is *the colour of the sea.*

As soon as the ship has left the English Channel the muddy green hue of shallow water begins to be exchanged

for the clear blue tint of the deeper seas, but it is not until the Bay of Biscay has been passed that the true colour of the ocean is to be seen in perfection.

So much has been written on this subject that it would be an impertinence to attempt anything like a description here. Suffice it to say that those who have seen that glorious blue as it appears in bright sunshine under a cloudless sky will feel inclined to regard the seas around our shores (although beautiful in their own way) as bearing much the same relation to the deep ocean as the waters of a pond bear to those of a mountain lake.

But the colour of the sea is constantly changing, from many causes. The mere reflexion of the clouds will turn it from the brightest blue to a dark indigo tint or an almost inky blackness, while the presence of ripples or waves also greatly modifies its hue.

It appears, however, that when viewed in a mass, pure sea water possesses in itself a clear blue colour quite irrespective of the reflexion of the sky; and in some cases the mingling of the prevailing yellow tints of the sandy beds of shallow seas with this natural blue of the ocean may tend to cause the green colour of shoal water.

In addition to this the colour is affected, especially near land, by the admixture of chalk, sand, and other suspended matter; also in some cases, even far out at sea, the presence of animalculæ or minute algæ will in certain localities produce a white, brown, red, or yellow discoloration of the ocean for many miles in extent.

Recent researches by Professor Tyndall have tended to establish the above fact. In a series of observations taken by him between Gibraltar and Spithead he found that the colour of the sea was largely dependent upon the particles of solid matter held in suspension. Careful examination of samples of water taken at various parts of the voyage proved that those portions of the sea which presented a

yellow-green colour contained the most suspended matter, whereas a deep black indigo colour indicated the greatest purity.

There can be no doubt, however, that the purity or otherwise of the water is by no means the only condition affecting its colour. The amount of sunshine or of cloud, the colour of the sky and the character of the light reflected from it, the angle at which the light enters the water, the clearness or density of the atmosphere, all exert a most important modifying influence upon the apparent colour of the sea—the same district of the ocean sometimes passing through every gradation of tint, from brightest azure to inky blackness, or, in more shoal waters, from emerald green to deepest olive, according to the amount and character of the light falling upon it in the course of a single day.

One of the first signs of approaching land or of getting into shoal water is a change in the colour of the sea. It loses its clear transparent blue and becomes of a dark olive-green hue, which changes to a lighter green as the water gets shallower, until it assumes the appearance familiar to us on our own coasts. One is sometimes surprised when out at sea, and perhaps several hundreds of miles from land, to see the colour of the ocean suddenly change from its characteristic blue to dark green. But on reference to a good chart we shall find that we are sailing over sand banks or reefs, which although perhaps a hundred or even two hundred fathoms below the surface are yet sufficiently near to account for this alteration.

The water of the ocean is almost always brilliantly clear, and any light coloured or bright object that is dropped overboard in full sunshine becomes converted, as it sinks, into brightest silver with a bluish-green tinge, and, gradually diminishing to a shimmering speck, is lost by distance rather than by obscuration.

The appearance of the *waves* in the Atlantic or Pacific Oceans is altogether different to what it is near land. The short chopping waves of narrow seas are exchanged for a long sweeping swell, which is always apparent, even in the calmest weather. The waves follow each other in regular succession, and are of great length, covering the sea with vast parallels separated by very broad and (in calm weather) shallow troughs. The distance from crest to crest of the Atlantic waves seems to average from about sixty to a hundred feet.

The height of the waves during a storm is often very considerable, but the current notions on this subject are exaggerated. To speak of waves as running "mountains high" is, of course, absurd unless regarded as a poetical figure. It is very difficult to form a correct estimate of their height, but from personal observation on several occasions I should judge that from twenty-five to thirty feet from the trough to the crest is the extreme limit, even in violent and continuous gales off Cape Horn or the Cape of Good Hope. By some observers, however, the maximum is placed higher, and I believe that Dr. Scoresby mentions having seen waves which attained a height of forty-three feet from trough to crest.

In order to raise waves of the largest dimensions, it is necessary that the wind should blow with violence from the same quarter for many consecutive hours, yet it is surprising to see how soon the sea will become turbulent when a brisk gale suddenly succeeds even the calmest weather. Two or three hours are sometimes quite sufficient to change the whole aspect of the sea from a dead calm to the wildest storm scene.

The disturbance of the sea is more than superficial: during very violent storms it is believed to affect the ocean to a depth of several hundred feet. The lowest

depths of the sea, however, probably preserve a state of perpetual calm.

The apparent velocity of the waves is often very considerable: in violent gales it has been computed at thirty miles an hour or more. But it will be noticed that the waves exercise little if any *propulsive* force upon floating objects; they seem to pass under a ship, for instance, without affecting its direction or even speed to any considerable extent. This is owing to the peculiar character of the wave-motion, into any explanation of which it will be unnecessary to enter here.

Those who have a taste for astronomy will watch with much interest for the appearance of the *southern constellations* as they rise above the horizon and reveal themselves more fully, night after night, as the ship sails southwards. Nearly every one seems to be disappointed with the first sight of the much-talked-of Southern Cross. The stars of which it is composed are large and brilliant, it is true, but they are few and not very symmetrically arranged, and indeed the whole constellation in shape more resembles an unevenly made boy's kite than a cross. Our own *Ursa Major* is, according to the opinion of many competent authorities, a far finer constellation than the Southern Cross.

But there are compensations for any disappointment with regard to the constellations of the southern hemisphere, for the stars there often shine with a brilliancy such as is seldom if ever to be seen in our own latitudes, and the planets will sometimes cast a long wake of light across the sea almost equal to that of the moon at its first quarter.

Then there is the *Milky Way*, which presents great peculiarities in the southern hemisphere. It is not only split or divided for part of its length (it has a general

resemblance in shape to a pair of trousers), but it also presents detached patches of nebulæ, like small luminous clouds, which are known as the Clouds of Magellan. The main portion of the milky way is also perforated by black patches perfectly devoid (to the naked eye) of stars. These spaces, which, by contrast with the surrounding luminous nebulæ, appear intensely dark, are called by sailors the "coal bags," and have a very curious appearance.

Occasionally very fine *Auroras* are seen at sea. One that was witnessed by the writer in lat. 43° 12′ S., long. 67° 24′ E., was thus described at the time :—"First there was a great glare over the southern heavens. Then from a point on the horizon which formed the centre of this glare there darted beautiful radiating bands of light of various changeable colours: blue, pink, red, yellow, and white. Besides these radiating lines there were concentric rainbow-like bands of light, but much fainter than the vertical ones. Every now and then all the bands suddenly shone out much more brightly and distinctly, as if by the drawing up of a gauze curtain."

Generally one or more *eclipses* or other astronomical phenomena are to be seen during a voyage, under conditions which are very favourable as regards clearness of atmosphere and comparative absence of cloud. An eclipse of the sun is very impressive at sea,—the light thrown upon the waves is strange and unearthly, and if it should happen that a storm is raging at the time, the scene is altogether one that is not likely to be soon forgotten.

Shooting stars and *meteors* are of frequent occurrence, and are often exceedingly beautiful. A meteor that I saw some years ago, when near the equator, gave a light equal to that of the moon at its full. The apparent size of the body was about half that of the moon, and it had a long spreading tail of the most lovely hues—red, purple, and blue. The arc through which it travelled could not have

been less than 100°, and during its transit the body changed from blue to white and from white to blue again. Its passage through the sky was attended by a loud whizzing noise.

Lunar coronas and *haloes* are of frequent occurrence and often of large size; and I must not forget to mention a curious appearance which is sometimes seen at sea, resembling a fragment of a rainbow set on end upon the horizon, and which is called by sailors a "sun-dog," or "rain-dog."

Waterspouts are not very frequently seen on the Australian voyage, and, however interesting they may be from a scientific point of view, their absence is scarcely to be regretted, as they are sometimes dangerous to ships. During most voyages, however, at least one or more will be seen, although sometimes the view is a distant one.

Waterspouts would seem to be caused by an eddy of wind resembling a minute cyclone, and rotating with such extreme velocity as to suck up a column of water from the surface of the sea. The column of water thus raised is sometimes several hundred feet in height. It is smallest in the middle and enlarged above and below, resembling two cones united at the apex. The upper cone consists of dense aqueous vapour, the lower of water. They are seldom of long duration, lasting usually only from a few minutes to half an hour at the longest. Their movements are very irregular; sometimes they advance with considerable rapidity, while occasionally they remain almost stationary. They are met with most frequently near the coast, and in tropical regions.

Nothing will excite more admiration than the magnificent *sunsets* which are often to be seen at sea. In some latitudes and in certain months of the year they are much

finer than in others, and evening after evening for many successive days the passengers congregate at the side of the ship to watch the setting sun and the western heavens.

The sunset clouds in the tropics often assume the most fantastic forms, producing effects resembling long processions of strange figures—men and beasts—with huge birds and flying dragons hovering over them. Sometimes they give the appearance of great plains of gold, or of seas studded with islands, or vast mountain ranges.

But it is the colours that are most extraordinary. Every tint that can be imagined is to be seen—from palest grey to darkest indigo or inky black ; from pink to deep lurid crimson ; and from lightest gold to deepest orange. A very curious pale apple-green tint is also frequently present in tropical sunsets. For the comfort of those who are not fond of early rising, it may be mentioned that sunrise at sea is seldom so grand as sunset.

Either north or south of the equator, according to the time of year (or very rarely on the equator itself), a point will be passed at which the sun will be exactly vertical at noon, and when he will throw *no shadow* from upright objects. It is quite possible, at that time, for the shadow of a slim man to be entirely included within that of his hat—if it has a tolerably broad brim.

As in England we of course never have any approach to a vertical sun, this phenomenon is worth noting.

Returning to the sea itself, I will now endeavour to give what must necessarily be a very brief and imperfect sketch of such of its living objects of interest as will meet the eye of an ordinary observer during most voyages to Australia.

WHALES.—When once fairly out at sea, it is seldom

that more than a day or two will pass without the cry of "Whale!" causing a general rush of passengers to the side of the ship.

But it must not be imagined that all whales are alike. On the contrary, the term "whale" is so wide in its application, and includes so many different creatures, that it will be as well to say a very few words as to some of the principal species and their general peculiarities.

The whale family (*Cetaceans*) as a whole are distinguished from the fishes in many important particulars. Their organization is much more perfect. They bring forth living young; breathe by means of lungs instead of gills; have a double heart; and possess warm blood, the temperature of which is kept up by a skin of great thickness and an enormous layer of fat or "blubber" from one to two feet in depth. They are also furnished with a "blowhole" in the upper part of the head which corresponds with the nostrils of terrestrial animals, and which is either single or double according to the species. The tail is also set on horizontally, instead of vertically as in the case of the fishes.

The cetaceans are divided into two great classes—viz., those that have teeth, and those that have a fringe of whalebone instead of teeth. The latter—the *whalebone whales*—are again divided into "smooth-backs" and "fin-backs."

Amongst the smooth-backs is included the Greenland whale (*Balæna mysticetus*), which is not only the largest of the whales, but also the greatest of all animals, attaining sometimes a length of sixty to seventy feet and a girth of some forty feet. The whale of the southern hemisphere, which corresponds to the Greenland whale of the north, is considerably smaller, but in other respects very similar. Its scientific name is *Balæna Antarctica.* Neither this nor the Greenland whale are believed to pass the equator, the two species remaining quite separate.

The fin-backs, which are at once distinguished by the large vertical fin rising from the back, are considerably smaller, as a rule, than the smooth-backs, although still huge creatures. They are the kinds most usually seen on the Australian voyage, especially in the North Atlantic, and are not nearly so valuable to fishermen as either the Greenland or the sperm-whale. All whalebone whales have *two* blowholes on the top of the head.

The whales with teeth include the *sperm-whale* (which is almost as large as the Greeland whale, and very valuable), and many smaller species, amongst which may be mentioned two that might scarcely be supposed to belong to the family of whales—viz., the dolphin and the porpoise. The whales with teeth have only *one* blowhole.

The apparatus with which the jaws of the whalebone whales are provided in lieu of teeth is most admirably adapted for securing the creatures upon which they feed. It consists of an enormous number (400 or 500) of laminæ of whalebone, placed side by side at a distance of less than an inch apart, and forming a gigantic fringe pendent from both sides of the upper jaw.

As these whales subsist almost entirely upon the small molluscous animals with which, in the localities frequented by the cetaceans, the sea swarms in countless myriads, their mode of feeding is rendered exceedingly simple. They merely move slowly along near the surface of the sea with their enormous mouths open to receive their prey. At intervals they close their jaws and eject the water through the whalebone laminæ, which, acting as a sieve, strain off the small molluscs which have found their way into this huge trap.

The various species of whales that are provided with teeth feed, as may be imagined, upon larger animals than the whalebone whales. The food of the sperm whale consists mostly of cuttle-fish of various kinds; while many

of the smaller cetaceans, as the grampus, are exceedingly voracious, and attack fishes of large size.

The view obtained of these monsters of the deep from the deck of a ship is usually only a very transient one. An immense black rounded mass, surmounted, in the case of the fin-backs, with an enormous vertical fin, is seen tumbling in haste away from the ship's side. Indeed, the peculiar tumbling, rolling movement of the cetaceans is very characteristic, and cannot be mistaken when once it has been seen. When startled by the approach of a ship, the whale usually dives into the depths of the sea, and only appears again at a considerable distance, where he can be seen spouting and rolling his great black back above the waves for a few moments before again disappearing from view. Occasionally, however, when swimming in a direction parallel to a ship that is not perceived by them, whales may be seen to much better advantage. In this way I was enabled on one occasion to watch for some time three whales—a "bull" and a "cow" accompanied by their "calf"—which swam close to the ship for a considerable distance, rolling about and disporting themselves without taking the slightest notice of us. The two full-grown whales were of enormous dimensions—at least forty to fifty feet in length.

As long as they are above water whales continue to spout at frequent intervals. The column, which is ejected to a height often of seven or eight feet, appears to consist of fine spray rather than of water. In fact, it is probable that the air and water are mixed together much in the same way as in a "spray producer."

In calm weather the sea is often observed to be covered with greasy-looking tracks of a peculiar appearance and of great length, extending as far as the eye can reach and intersecting each other in many directions. These marks are a sign that cetaceans of some kind are

about, and sometimes a large number of whales constituting what is called a "school" may be seen spouting in all directions.

Although, as a rule, these monsters make haste to get out of the way of an approaching vessel, yet cases have been known in which a ship has been violently struck by the tail of an irate whale,—an event by no means to be desired. A year or two ago a steamer was struck in this way, and the blow broke one of the blades of the screw-propeller and disabled the ship. Soon afterwards a dead whale was seen floating in the same locality with a large gash in its side, the inference being that in striking the ship it had itself received a mortal wound from the propeller.

The whale, big and powerful as he is, has enemies, the principal ones being the thresher-fish, the sword-fish, the saw-fish, and the Greenland shark; all of which, though greatly inferior in size to their gigantic adversary, frequently overcome him in combat. The thresher-fish or sea-fox attacks the whale by threshing him with his tail, and, his superior activity enabling him to avoid being struck in return, he often succeeds in killing the whale by his persistent castigation. The whale endeavours to escape from his enemy by diving to the depths of the sea, whither it is supposed that the thresher cannot follow him. I was once fortunate enough to witness a contest of this kind. The thresher constantly leaped out of the sea and descended with tremendous violence upon the whale, which struggled and lashed the waves with impotent fury until the sea was covered with foam. For some reason (which the captain suggested might be the presence of a sword-fish) the whale did not sound, and the combat continued at the surface until the combatants passed out of sight beyond the horizon.

The threshers and the sword-fish are said systematically to hunt the whale in company—the former attacking him

on the surface of the sea, and the latter at the same time stabbing him from below; but this seems to be somewhat problematical. There is no doubt, however, that both the sword-fish and the saw-fish are persistent enemies of the cetaceæ, for whom their powerful weapons make them formidable foes.

All these creatures, as well as the various sharks—but especially the Greenland variety—feed upon the whale when dead; hence, no doubt, arise their efforts for his destruction.

Whales are troubled with parasites of various kinds. Old whales are sometimes found almost covered with barnacles and masses of sea-weed; and a peculiar kind of louse of gigantic proportions infests their skin to such an extent as in some cases to cause large sores, and to attract numbers of birds which alight upon the back of the whale to devour these parasites.

Dolphins and Porpoises.—Few days pass at sea without there being seen a troop of active creatures rushing along by the side of the ship, leaping from wave to wave, and apparently enjoying themselves immensely. These are invariably called porpoises by the sailors, but according to scientific writers it would appear that they are in reality the dolphins of mythological celebrity (*Delphinus Delphis*).

A good deal of confusion seems to exist with regard to the distinction between the dolphin and the porpoise; but it would seem that the true porpoise (*Delphinus Phocœna*) is smaller than the dolphin, being indeed the least of all the cetaceans, and attaining only a maximum length of some five feet. It frequents the estuaries of rivers, calm bays and sea-shores generally, rather than the open sea. The dolphin, on the contrary, prefers the wide expanse of the ocean, and travels in companies or "schools" of from two or three to fifty or more.

Of all the denizens of the sea dolphins appear to be the most playful, and they seem to have a special liking for following or swimming beside a ship, especially when she is sailing at a good speed. It is then a beautiful sight to watch them rushing through the water with such velocity that they seem to be covered with a silver film, while now and again they leap from wave to wave, following in each others' wake with a peculiar movement of their rounded backs that irresistibly reminds one of a boy's game of leap-frog. Occasionally one of the company more active than the rest turns a complete somersault; and on one occasion I saw a dolphin that appeared to be quite a professor of the acrobatic art, for he repeatedly leaped high out of the water, and turned *three* complete somersaults whilst in the air!

When in a calm sea a large number of dolphins are seen near the horizon indulging in their peculiar habit of rolling their rounded backs out of the water at regular intervals along an extended line, it is easy to understand how the notion of a monstrous sea-serpent may have taken its rise; for the appearance presented bears a really striking resemblance to the convolutions of an enormous snake.

In the cold latitudes of the southern hemisphere the dolphins (or porpoises as they are always called on board ship) present quite a different appearance to those of the warmer northern seas. They are smaller in size, and are pied with large patches of bluish-white, which give them a very peculiar appearance. These dolphins are, if anything, even more lively than their northern brethren.

The sailors often try to spear the dolphin from the bows of the ship with a kind of harpoon, and occasionally one is speared; but it seems a pity that such a happy-looking creature should have its existence cut short, especially as its body is almost useless for food. Sometimes, indeed, its flesh is eaten; but those who have partaken of it say that

it bears a strong resemblance to fine sponge saturated with train oil!

The dolphin and the porpoise closely resemble in their general formation the larger cetaceans. They have the same smooth, tough skin and rounded form, as well as the horizontal tail, to which, no doubt, their peculiar rolling movements in swimming and leaping are greatly due. Their mode of progression is in fact altogether different from that of the fishes, for whereas the latter swim by means of a series of lateral movements, the cetaceans obtain their impetus by doubling their flexible tail under them and forcibly extending it.

FISHES.—Although the sea, even in its remotest regions, doubtless swarms with fishes of every imaginable species, yet it is a fact that in an ordinary ocean voyage, such as that to Australia, the different *kinds* that will be seen might almost be counted on the fingers, although the number of individuals belonging to one species (as in the case of the flying-fish) is, in some cases, innumerable. There are some few kinds of fishes, however, that will seldom fail to be met with in the course of every voyage, and some little account of these may be of general interest.

Sharks.—Of all the members of the great family of fishes these have probably gained the worst name. Sailors regard them with an almost superstitious hatred, and neglect no opportunity of capturing them if they are seen prowling about a ship; and although some of the "yarns" that are told with reference to their ferocity are probably somewhat exaggerated, yet enough that is authentic remains to prove that the shark is indeed one of the most dangerous of the inhabitants of the sea, and by no means a desirable bathing companion. Where sharks abound—as they do, for instance, in Sydney harbour—it is necessary to construct bathing-places that are enclosed with palisades for the

protection of the bathers. Fortunately, our own shores are very rarely visited by any of the more formidable kinds of these unwelcome guests.

Of all the different species of sharks, the largest, strongest, and most ferocious is the white shark (*Squalus carcharias*), and this is the kind that is most frequently caught at sea. Those that are generally taken are from ten to fifteen feet in length, but sometimes these monsters attain a length of twenty-five, or even thirty, feet from the snout to the tip of the tail.

The appearance of the white shark is sufficiently repulsive. It is of a bluish-green colour on the upper surface of the body and dull white beneath. Although its general outline is elongated, there is a peculiar rounded appearance about not only the body itself, but also the fins and tail, that gives it somewhat the look of being made of thick leather stuffed with some soft material, and which greatly adds to the unpleasantness of its aspect. The eyes are small and dull; and the enormous mouth, which is shaped somewhat like the letter U, is placed far back under the snout, so that it is easy to see why the shark cannot snap at anything above him without turning on his back. The jaws are furnished with a multitude of sharp triangular teeth, arranged in rows and slanting backwards: these can be raised or depressed at will.

The *Blue Shark*, which is also sometimes caught at sea, is both smaller and more slender than the white shark. It is darker in colour on the back, somewhat more symmetrical in form, and altogether less repulsive in appearance, than its larger relative.

The larger sharks are usually attended by from one to six or eight Pilot-fish (*Naucrates ductor*), lovely creatures belonging to the mackerel family, and of about the same size as the common mackerel. They are most beautifully marked with transverse bands of brightest azure blue, alternating

with deep black or indigo blue. They appear to hold much the same position towards the shark that the jackal is supposed to do to the lion. From personal observation I can testify that the pilot-fish appear to call the attention of their master to any food that he may not have noticed, and that they appear much disconcerted when he is hooked and hauled on board ship. They are no doubt actuated by interested motives, and probably appropriate the smaller fragments of any prey, destroyed by the shark, which would have been beyond their own powers of attack, but at the same time they evidently preserve most friendly relations with their huge companion.

A number of small parasitical fish, an inch or two in length, are often found attached to the lips of a shark, and are called by the sailors "suckers."

As catching a shark is one of the few excitements of sea-life, perhaps the following account (written many years since) of the first capture witnessed by the writer may not be altogether out of place :—

"But our attention was soon withdrawn from the ship we had been watching by a new excitement. For some one who was looking over the side cried out "A shark!" whereupon all rushed to the gunwale. I shall never forget the impression made upon me by that first sight of the monster, about whose ferocity and cruelty we had just been conversing. There he lay, long and grim, floating near the surface of the clear water, which, as the bright sunshine fell upon it, beautified his ugly form with sparkling emerald tints. Hovering and darting about his head were six pilot-fish—creatures of exquisite beauty, bright with transverse bars of gem-like azure blue and deepest indigo. A shark-line was already hanging from the stern. It consisted of an enormous hook attached to a short length of chain, which was made fast to an inch and a half rope—in fact, the main-brace of the ship. The hook was baited

with two or three pounds of fat pork. After the shark had once or twice dived downwards until he became a mere faint shimmering silver speck far down in the clear depths of the sea, the attendant pilot-fish appeared to become aware of the savoury morsel upon the hook; they became greatly excited, swam round the bait, sniffed at it, and then darted back as if to communicate with their master, who then appeared to place himself under their guidance, and having turned over once to look at the morsel (the eyes being on the under surface of the head) turned over a second time and snapped at it. Thereupon the captain, who was presiding at the line, gave a vigorous pull and the monster was hooked through the upper lip. He took it all very quietly at first, and allowed himself to be dragged half out of the water without remonstrance. As, however, the hook would not bear the entire weight of the shark, we attempted to pass a noose over his body, but this not being to his taste he gave himself one vigorous shake, which had the effect of tearing out the hook through the whole thickness of the lip and setting him free. Much to our chagrin he dropped back into the sea and quietly swam away as if nothing had happened; but those who were learned in such matters declared that he would soon be back again, for such is the greediness and stupidity of these creatures that they never profit by their experiences, however painful they may be. Sure enough, in about ten minutes back he came, and being allowed this time more effectually to take the bait, he was hooked right through the jaw, and was again hauled up. A noose was passed round the middle of his body and a second round his tail, and so by the united efforts of some twenty men he was hoisted on board. Then, amidst the howls and execrations of the sailors, he was dragged off the poop forward to the forecastle, where the carpenter cut off his tail with his axe, and the butcher plunged his knife into the spinal

marrow in order to despatch him, every one standing clear in the meantime, as a blow from the tail of even a small shark is sufficient to break a man's leg, and this monster was some fifteen feet in length! When the tail is severed from the body a shark is rendered harmless in this respect, on account of the principal muscular attachments being severed, but it is still necessary to be very cautious with regard to the jaws, which will continue to snap savagely at anything placed near them, even after the trunk has undergone the greatest mutilation. In this case so great was the tenacity of life that, even after the head had been severed from the body with a view to preserving the jaws, and the backbone had been entirely removed to be subsequently made into a walking-stick, the mutilated carcase continued to flounder about for a considerable time, and the heart, that was placed in my hands for examination, continued to pulsate strongly for fully twenty minutes; and even when cut up for examination at the end of that time, each fragment showed signs of vigorous muscular action. In the meantime the pilot-fish, having lost their master, evinced their faithfulness to his memory by following close to the ship for many hours after the decease of the shark."

The flesh of the shark, although to most tastes exceedingly coarse and unsavoury, is sometimes eaten by the sailors, who are glad of anything to vary the monotony of their usual diet.

The saw-fish (*Squalus pristis*) and the sword-fish *Xiphias gladius*) are both closely related to the sharks, and are occasionally seen during a voyage to Australia, especially in the tropical calms. The saw-fish, whose upper jaw is prolonged into the peculiar snout of some three feet in length that is to be found amongst most collections of curiosities, has his weapon furnished on each side with projecting teeth, whereas the weapon of the sword-fish is

smooth and considerably shorter. On the other hand, the swòrd-fish sometimes attains a length of twenty feet, whereas the saw-fish seldom exceeds twelve or fourteen feet. Both these creatures attack the whale, to whom their powerful weapons render them formidable adversaries.

Another fish met with far out at sea is the bonito (*Thynnus pellamys*), called sometimes by the sailors the "skipjack." This, like its near relative the tunny, is a member of the mackerel family, and is one of the greatest enemies of the flying-fish. It is thick and rounded in outline, and attains a length of about thirty inches. The bonito is an active fish, and has a habit of swimming about the bows of a ship, keeping up with the vessel for many hours at a time, even when she is sailing at a very considerable speed. The sailors often endeavour to spear the bonito, as its flesh is much appreciated by them, although it is rather coarse, and is sometimes poisonous, producing a kind of erysipelas of the face and head. This effect, which is occasionally produced by several other kinds of fish, is probably due to some peculiarity in the food upon which they have subsisted.

At the end of a voyage to Melbourne, when sailing through Bass' Strait, great shoals of large fish called there "barracouta" are usually met with. In its general appearance the barracouta somewhat resembles a pike, but it is longer in proportion to its thickness, and much more graceful in shape. Its colours are splendid, comprising iridescent tints of green, blue, silver, and pink, which change to a slight extent at death. The average length of the barracouta is about three feet. If the ship happens to be going along at the rate of six or eight knots an hour, these fish can generally be caught in immense numbers by means of lines towed astern. A large hook may be used, baited with red cloth or red feathers, and this is the most

effectual way of capturing them; but the sailors often use only a piece of mahogany or teak, about three inches long, with a sharp spike projecting from it with an upward curve. Mahogany, feathers, or red cloth, are all one to the barracouta; he rushes after the bait as it is towed swiftly along on the surface of the sea and swallows it greedily. He will sometimes manage to escape from the unbarbed spike, but a hook catches him effectually. I have seen as many as forty or fifty of these fish caught in a couple of hours by three lines. The barracouta is good eating, its flesh is white and firm, but to the taste of some rather coarse and dry. The sailors, however, as well as the passengers, greatly appreciate this variety in their diet, and the fish are usually caught in sufficient numbers for all hands to have a good feast of them.

The barracouta is met with on many shores. In the West Indies it is plentiful; but when caught off some of the islands it is poisonous, whilst when taken near others it is wholesome. At the Cape of Good Hope and at St. Helena it constitutes a most important article of diet, but in both those places it is known by the uneuphonious title of the "snook."

Any portion of wreck or other timber that is met with in the warmer latitudes, and which has been floating for some time, will, if examined, be found not only covered with barnacles, but also, in many cases, surrounded by a number of fish of a dingy brown colour, and resembling in shape a carp or bream. These fish, which average about five pounds in weight, are called by the sailors "old wives," or "old maids," and, unlike the majority of deep-sea fish, they are really remarkably good and delicate eating. So well is this understood, that the captain of a sailing vessel will in calm weather occasionally send a boat's crew to investigate any floating timber and to spear the fish. A number of sea-birds may generally be seen

hovering over any drifting object of this kind—attracted, no doubt, by the barnacles, fish, and other living creatures that are congregated around it.

As soon as the ship has entered the tropical regions of the sea the *flying fish* begin to make their appearance. They must exist in enormous numbers, for sometimes for many successive days they may be seen constantly rising and darting away from the ship in shoals of many hundreds at a time. Those who watch them carefully will, I think, be led to the conclusion that there are two species or varieties of flying fish usually associated together. One of them, excepting the back, which is light blue, is of a uniform silvery-white colour all over, including the "wings," which are very delicate and transparent. This kind is about the size of a herring, always seems to rise in shoals, and does not fly more than from twenty to fifty yards. The other variety is a good deal larger, being about the size of a mackerel, which fish it also somewhat resembles in colour, except that the under part is of a purer and brighter white, while the "wings," which are of course only largely developed pectoral fins, are of a reddish-brown colour. This species is capable of supporting itself in the air for a distance of from a hundred and fifty to two hundred yards; and it would seem that the only reason why it cannot take even a longer flight is because the fin-wings become dry and stiff, their rapid vibration evaporating the moisture from their surface.

It has been affirmed by some writers that the flying fish does not in reality fly at all, but that its passage through the air is merely the result of an impetus obtained before quitting the sea. I think, however, that the majority of those who carefully watch the flight of these creatures will be inclined to agree with Charles Kingsley that this can scarcely be the case. The fact that the fish frequently rises and falls during its passage through the air, and also

that it is capable of altering the direction of its flight without touching the water, would alone negative this supposition; whilst the rapid and bird-like vibrations of the "wings," and the distance traversed, seem to mark the movement as a genuine flight. There can be little doubt that the wonderful power of leaving their native element has been given to this family of fishes to enable them to escape from their enemies, the principal of which are the bonito and the albacore, which prey upon them in enormous numbers. If carefully watched when they rise in shoals, it will generally be seen either that some larger fish is in pursuit of them, or that the roll of the vessel has alarmed them.

At night flying fish are attracted by any artificial light, and they will sometimes fly on board a ship. Sailors occasionally catch them by spreading a sail, supported horizontally on poles, near the surface of the sea, and placing a lighted lantern above it. In this way a good many may be taken; and it must not be forgotten that, as an article of food, they are quite a delicacy, closely resembling a whiting in flavour.

The region of flying fish in the Atlantic appears to extend a greater distance to the south of the equator than to the north. In the northern hemisphere they are seldom seen until the tropics have been well entered, whereas in the southern hemisphere I have met with them around the Australian shores, and even near the southern coast of Tasmania.

Most of the fishes that have been hitherto mentioned may probably be seen by any one with a moderate amount of observation during an ordinary voyage to Australia, but there are many others (such as the sun fish, the porcupine fish, etc., etc.), which are of great interest, but which, as they are more rarely seen, need not be described here.

I must not, however, omit to mention the occasional

appearance of shoals of innumerable tiny fishes (probably the small fry of some larger kind), which, although not remarkable in themselves, yet present, in a calm sea, a very beautiful spectacle.

One of these shoals is thus described in an old journal:—"Just before sunset we observed a large number of what appeared to be particles of shining silver rising out of the water and falling again with tiny splashes. They proved to be innumerable small fish of about the size of whitebait. They had brown backs; and when they floated quietly in a dense shoal near the surface of the sea they presented the appearance of a great mass of sea-weed, but when they leaped from the water, which they all seemed to do simultaneously, bringing the pure white under surface of their bodies into view, they produced the beautiful effect of a shower of silver particles."

On another occasion, when the same thing was seen at night in the tropics, the effect was even more striking—each tiny fish as it fell producing a brilliant spark of phosphorescent light.

A considerable number of *turtles* aré met with in the neighbourhood of the island of Madeira and the adjacent seas, and as calms and light winds are very frequently experienced in this locality, opportunities occur not only for seeing but also for catching these creatures. They may be seen floating lazily and apparently asleep on the surface of the sea, nothing being visible of them but their little black heads and a very small portion of the rounded shell of the back. When a boat is despatched to catch turtles, the crew endeavour to approach the creature without waking or startling it, because if alarmed it immediately sinks and is lost. The rowers, therefore, exercise the greatest caution, and abstain from rowing altogether when within a couple of boats' lengths of the

turtle, allowing the boat to glide up to their unsuspecting victim by its own impetus; the steering under these circumstances being a matter of some delicacy. The member of the party who is to catch the turtle stands in the bows of the boat, and when near enough pounces upon it, and seizing it by one of its flippers, lifts it into the boat before it has time to recover from its astonishment. Several turtles are often taken in this way during one short trip; and the poor creatures present a sufficiently grotesque appearance as they lie helplessly on their backs in the bottom of the boat, craning their long necks and slapping themselves with their fore flippers.

The turtles taken off Madeira are generally small, not exceeding fifty or sixty pounds in weight; but they are specimens, though small ones, of the green turtle (*Testudo Midas*), which often attains a length of seven or eight feet, and a weight of nine hundred or even a thousand pounds.

It must be confessed that these small turtles are somewhat deficient in the green fat dear to aldermanic palates. At any rate, the turtle soup manufactured at sea is not a great success.

There are many points in connection with the anatomy and habits of the turtle which are of very great interest, but space will not allow of their being all touched upon here. It will be sufficient to mention that the horny covering (or *carapace*) of the turtles and tortoises is not a shell, as might be supposed, but a sort of external skeleton formed by the amalgamation of the vertebræ, ribs, and breastbone. This bony case has openings through which the head, legs, and tail protrude, and is covered externally with those large plates or scales which give the turtle tribe their peculiar tesselated appearance. These scales are most finely developed in the species from which the tortoiseshell of commerce is obtained (the *Testudo imbricata*), from

whose back the plates are torn while the unfortunate reptile is still alive. The turtle, being a cold-blooded animal, is unable to hatch its own eggs. It therefore deposits them, many hundreds at a time, in holes in the sand, where the heat of the sun hatches out such of them as escape the depredations of birds and beasts.

But it is in the lower forms of animal life that the sea most abounds, and presents a field for observation and research such as can probably be found in no other domain of nature. Some slight idea of the teeming millions of living creatures in the sea can be formed when we remember that deep sea soundings have revealed the fact that the bed of the vast North Atlantic Ocean (as well as other seas) is formed of a thick layer of microscopic shells (*Foraminifera*, *Diatomaceæ*, etc.), which formed the habitations of animals that have lived and died at the surface of the sea. And these are only two out of numberless tribes that inhabit the ocean!

Maury, in his "Physical Geography of the Sea," thus refers to this subject: "The ocean teems with life, we know. Of the four elements of the old philosophers—fire, earth, air, and water—perhaps the sea most of all abounds with living creatures. The space occupied on the surface of our planet by the different families of animals and their remains is inversely as the size of the individual. The smaller the animal the greater the space occupied by his remains. Though not invariably the case, yet this rule to a certain extent is true, and will therefore answer our present purposes, which are simply those of illustration. Take the elephant and his remains, or a microscopic animal and his, and compare them. The contrast as to space occupied is as striking as that of the coral reef or island with the dimensions of the whale. The graveyard that would hold the corallines is larger than the graveyard

that would hold the elephants." After reading such an estimate as the foregoing of the wealth of animal life contained in the ocean, even an ordinary observer can scarcely help regarding it with increased interest, while those who have a taste for marine zoology or microscopic research will look forward to their voyage without any fear of *ennui*.

Unfortunately there is some little difficulty in prosecuting the study of the larger forms of marine life, because it is only in calm weather and when the ship is sailing quite slowly that it is possible to tow the larger nets required for their capture; while in a steamer it will never be practicable to do so, on account of the speed at which she moves.

As for microscopic organisms, however, there is scarcely a pailful of water pumped up from the sea but will yield, when filtered, a rich harvest of objects for examination.

For obtaining crustacea, molluscs, jelly fish, etc., of moderate size, the following will be found a useful kind of net:—A strong wooden hoop, about twelve or fifteen inches in diameter (a child's hoop answers very well), acts as a framework for a net of the same shape as an ordinary landing net, and of about the same depth. The net should, however, be very fine—its meshes not being more than about three-sixteenths of an inch square. If rectangular netting of sufficient fineness cannot be obtained, the ordinary bobbin net of the shops may be used, although this is much more likely to be destroyed and torn. The net should be made as waterproof as possible by means of boiled linseed-oil or tar. To the circumference of the hoop four pieces of line, about a yard long, should be attached at equal distances, and these joined together and fastened to a stout cord of thirty or forty yards in length. One side of the hoop is weighted with a piece of lead about two pounds in weight. If this arrangement is put

overboard and towed astern when the ship is sailing at not more than about three or four knots an hour, it preserves a vertical position with about half its diameter submerged, and collects from that part of the surface of the sea over which it passes any object that is not so small as to pass through its meshes.

In this way, with a little perseverance, numberless objects of interest may be obtained—crustacea, molluscs, marine annelids, jelly fish and polyps, in infinite variety and of strangest forms; and as this vast storehouse of animal life has even now been but imperfectly investigated, there is always the probability of meeting with something that has hitherto been altogether unknown to science.

Of all these creatures of the ocean, I will only pause to speak of one, which is brought so prominently under the observation of all voyagers in calm tropical seas, that even those who are least interested in such matters generally, can scarcely fail to be struck with it. I refer to the "Portuguese man-of-war" (*Physalia Caravella*), perhaps the most beautiful of all the cœlenterata. It is most generally met with in the equatorial calms, and when seen floating upon the blue tropical sea, with its semi-transparent, sail-like air-vessel bright with pink and azure-blue, glistening in the sunlight and turning with every breath of air, it indeed forms a lovely object.

It is by no means difficult to obtain one of these floating gems, either by means of the net described above, or even with a bucket attached to a line; and it will then be found that only half the beauties of the creature have been revealed above the surface of the water. All that has hitherto been seen is the air-vessel, formed of a thin iridescent membrane, surmounted by a brilliant carmine comb or crest. But it will now be discovered that from its under surface hang clusters of tentacles, which are of the most vivid blue and violet colour, and which when

fully elongated extend, in a large specimen, to a length of five or six yards. These are the "fishing lines," with which the physalia angles for its prey; and beware how you touch them, for they will inflict a sting far exceeding in severity that of the most virulent nettle; and in some cases, where a large portion of the surface of the body has been exposed to the grasp of the tentacles, serious results have been known to ensue. With these weapons the "Portuguese man-of-war" is able to paralyse the resistance of creatures considerably larger than itself, such as the flying fish, or even the bonito. The physaliæ vary in size from less than an inch to eight inches or more. These dimensions apply, of course, to the air-vessel.

Numberless interesting objects for microscopical examination may, as before suggested, be obtained by simply filtering through fine muslin or filtering paper the sea-water that is pumped up by the deck-pumps. But as the openings of the pipes that supply the pumps are several feet below the water-line, it is necessary, in order to obtain animalculæ from the surface of the sea, to bale up the water by means of a bucket, or, which is far better, to use nets constructed on the same principle as those that have been recommended for the larger medusæ, etc., but very much smaller in size, and covered with fine linen or flannel instead of netting.

These small nets (which are preferably made upon an oblong wooden framework), can be employed when the ship is sailing at a considerably greater speed than that at which it is possible to use the larger ones.

The phosphorescence of the sea is so closely linked with the lower forms of organic life, that a few words on this subject will not be out of place here. As a general rule, it is in the tropics that the most striking displays of this remarkable phenomenon are to be observed; but this is not always the case, for in the more temperate seas, and

around our own shores, the phosphorescence is occasionally truly magnificent.

Perhaps the grandest aspect under which this spectacle can be witnessed is when, on a dark night, a ship is sailing rapidly through a boisterous sea charged with phosphorescent matter. The crest of each wave as it curls over and breaks into foam is brightly luminous; cascades of pale liquid fire seem to be thrown from the bows of the ship; while her wake is converted into a broad path of light widening as it recedes, until lost in the horizon.

But scarcely less lovely are the appearances sometimes presented when the ship is lying becalmed in the tropics, with her sails flapping as she rolls heavily in the long Atlantic swell. Each ripple caused by her movements produces vivid sparks and coruscations of light, generally silver or pale blue, but sometimes fiery red; and round the rudder, where the water swirls and eddies most, the scintillations are the brightest. As we look attentively downwards into the depths of the sea we shall also see floating by from time to time the forms of the various jelly-fish and other organisms that we have noticed in the daytime, each faintly outlined in its own phosphorescence. Nor is it only these lower forms of life that are luminous. Large and small fish may sometimes be seen with their shapes marked out in pale blue light. When off the Cape of Good Hope, we saw one night a swarm of tiny fish which played about near the rudder of the ship. Each fish was clearly visible in its own phosphorescent light, while, every now and then, one of them leaping out of the sea, made a bright silver star on its surface as it fell. Presently the shoal became singularly active and excited, darting about and leaping in every direction. The cause was soon manifest: five or six large fish (probably bonito, and also luminous) were seen gliding and turning amongst the small fry until in a few minutes they had

devoured the whole. Once, too, when boating at night in Sydney harbour, three or four sharks accompanied the boat for a considerable distance—the outline of each being clearly visible by its own luminosity.

The nature and causes of the phosphorescence of the sea are even now far from being thoroughly understood. One point, however, appears to have been clearly established,—viz., that phosphorescence is in every case due to the presence of organic matter, either living or dead. Many different living organisms possess the property of luminosity, and nearly all belong to the lower forms of life. Most are minute, some microscopic, but a few are of considerable size, as the Venus' belt (*Cestum Veneris*) and the pyrosomas. In our own seas the phosphorescence is believed to be principally due to a minute infusorial animalcule—the *Noctiluca Miliaris*, which is barely visible to the naked eye. Some fishes also are *constantly* luminous, as the sun-fish, while others possess this property at times; but it is doubtful whether, in some cases at least, the luminosity may not be due to the presence of minute phosphorescent animalculæ either adherent to their surface or present in the water through which they are moving.

But it is not in the animal kingdom only that this property exists: some algæ also possess it; and lastly, decaying organic matter will sometimes emit phosphorescence, either when present in a mass or diffused in minute particles through the water.

SEA-BIRDS.—A few words about sea-birds will conclude this brief sketch of the living objects of interest seen at sea. During the whole of the voyage from England to Australia it is seldom that a day will elapse without the presence of one or more species of sea-birds enlivening the solitude of the ocean.

The most universal of all is perhaps the "Mother Cary's

chicken," or stormy petrel (*Procellaria Pelagica*). This pretty little ocean-bird, which somewhat resembles the swallow in its size, colour, and to a certain extent in its flight, may be seen in every kind of weather flitting about near the stern of the ship. It flies close to the surface of the sea, often dipping its feet in the water ; but I do not remember ever to have seen it resting upon the sea, although perhaps it does so at night. In the roughest weather it flutters about in the troughs of the great waves, where it seems to be but little influenced by the fury of the winds ; while on the other hand it appears to be quite as much at home when skimming over the glassy surface of the calm tropical seas.

When examined closely, the Mother Cary's chicken is found to possess delicate little black feet, which are webbed like those of other aquatic birds, and a short hooked beak, with somewhat tubular nostrils, from which it has the power of ejecting an offensive oil when alarmed. Passengers sometimes endeavour to catch the stormy petrel and other small birds by the simple expedient of allowing a long piece of black thread with a small button at the end to fly astern of the ship. The little bird, in its constant flitting to and fro, sometimes entangles its wings in the thread, and is easily drawn on board. The sailors have, however, a superstitious dislike to the capture of the Mother Cary's chicken, and if a violent gale were to arise soon after one had been destroyed, they might feel somewhat inclined to make a Jonah of its captor.

In northern latitudes, and while passing the Bay of Biscay and the coast of Spain, various kinds of seagulls are met with ; but as most of them are familiar visitors to our own shores, any description will be unnecessary here.

As the tropics are approached, these gradually disappear, and the ubiquitous Mother Cary's chicken remains

almost the solitary representative of the sea-birds. When passing, however, comparatively near land, a visit is occasionally received from land-birds of various kinds, and these are sometimes met with at a distance of a hundred miles or more from the nearest shore.

When in the neighbourhood of solitary islands, such as Ascension, large flocks of the gannet or *Soland goose* frequently make their appearance, and may be recognized by their white wings banded with black near the tip, and by their mode of flight, which is quite different from that of most sea-birds. The Soland goose, at any rate while young, is useful for food, and enormous numbers of the birds are bred upon the Bass Rock in the Frith of Forth. Some of these find their way into the Edinburgh markets.

It is, however, when the ship has passed through the tropics, and has entered the cooler latitudes of the southern hemisphere, that the greatest number of sea-birds are to be seen.

Now for the first time the stately albatross (*Diomedea exulans*)—the largest of all the sea-birds—makes its appearance, and seldom fails to impress the beholder, by its indescribably graceful and majestic flight even more than by its size. Whether poising itself in mid-air with extended wings, or swooping along with the swiftness of an arrow, everything appears to be done without the slightest effort. An albatross may sometimes be watched for five or ten minutes at a time without detecting any movement whatever of the wings, although it may at the time be gliding along with great rapidity. Its mode of flight, in fact, in common with that of some others of the larger sea-birds, always appears a mystery.

When seen on the wing, it can scarcely be credited that the size of the albatross is as great as it proves to be. The average width from tip to tip of the extended wings

is from nine to twelve feet,—these are quite ordinary measurements,—but birds have frequently been taken measuring fourteen feet; and there is an albatross in the museum at Sydney the width of whose wings is seventeen feet!

The younger birds are quite dark in colour, almost approaching black; while the very old birds, especially in the colder latitudes, are almost pure white. The birds of medium age have white bodies, with wings and tail banded more or less with black or dark grey.

The albatross belongs exclusively to the southern hemisphere,—it cannot cross the equator; and although the Zoological Society have, I believe, offered a large premium for a living specimen, all attempts to bring the birds through the tropics have hitherto failed, on account of their being killed by the hot weather.

For many days in succession the albatross will follow in the wake of a ship, pouncing down upon whatever is thrown overboard of an edible nature. It is by no means a particular feeder, and is also, it is to be feared, somewhat ferocious, as the following story that was told the writer by an eye-witness will testify. While in the southern latitudes a sailor was unfortunate enough to fall overboard when the ship was sailing at a considerable speed. He managed, however, to get hold of some fishing-lines that were towing astern, and would have been rescued; but several albatrosses swooped down upon him, and, tearing at his eyes and face, caused him to lose his hold, and perish before the eyes of his comrades.

Although usually seen on the wing, the albatross not unfrequently settles on the sea; and sometimes a flock of six or eight may be seen swimming about, like so many enormous geese, quarrelling over some choice morsel of offal.

The albatross is caught by means of a hook baited with fat

pork and prevented from sinking by pieces of cork attached to the line immediately above it. The bait is towed astern, and when a bird approaches, the line is paid out rapidly so as to give the piece of pork the appearance of merely floating. It is almost impossible to do this effectually when the ship is sailing at a speed of more than five or six knots, and even under the most favourable circumstances the birds often evince a wonderful power of discrimination between the bait and anything else eatable. Occasionally, however, when "on the feed" (which is usually early in the morning), they may be captured with the utmost ease, and I have seen as many as fourteen taken with two lines in half an hour. So voracious were the birds on that occasion that they quarrelled and fought for the bait, making a most peculiar cackling noise as they endeavoured to drive each other away from it. As soon as one was caught two or three others swam after him as he was drawn up, pecking at him and evincing great indignation at what, no doubt, seemed to them a monopoly of the food. An albatross, when placed on deck, is unable to take flight, owing to the great length of its wings and the comparative shortness of its legs. Seen under these circumstances it seems sadly out of its element, and has a somewhat clumsy, awkward look, very different to the majestic appearance that it presents when on the wing. No sooner is an albatross brought on board than it ejects the contents of its stomach,—a phenomenon not uncommon with sea-birds when alarmed. It may be as well to mention that the most merciful method of killing an albatross—and, in fact, all birds—is to pierce the upper part of the spinal cord, at the point where it leaves the skull, by means of a long, sharp instrument, such as a sailmaker's needle. If this is done properly (a lateral movement should be given to the needle in order to divide the cord), death is instantaneous, and the skin of the bird is uninjured by the puncture.

The breast of the albatross, which, besides the larger feathers, is covered with a thick layer of fine down of snowy whiteness, is prized for making ladies' muffs and trimmings. The small wing-bones are used for pipe-stems, and formerly commanded a good price, while the feet, skull, etc., are prized as curiosities; so that there is some little excuse for capturing this monarch of the sea-birds.

But it is down in the "roaring forties," between the Cape of Good Hope and Australia, that the sea-birds flock around the ship in greater numbers and varieties than during any other portion of the voyage.

In a work like the present it would be impossible even briefly to describe each kind with any approach to scientific accuracy. I shall therefore only attempt to enumerate the principal varieties, giving the familiar names by which they are known to sailors.

Next in size to the albatross is the *Mollymoke;* which closely resembles its larger relative, but may be distinguished from it by a band of black, which extends across the back between the wings.

Then there is a most diabolical-looking bird known to seafaring men by the unsavoury title of the "Stink-pot," or *Cape hen.* It is of a uniform dark ashen grey, almost approaching black, and has great staring yellow eyes.

The bird known as the *Sea-auk*, also a sooty bird, is a good deal like the preceding, but has white spots on the wings, and is of a somewhat different shape.

The *Mutton-bird*, a good deal smaller than any of the preceding, has a brownish back and white breast. It is very fair eating, and abounds on the coasts of Australia, where it is sometimes sold in the markets.

Next in size is the *Cape Pigeon* or Cape dove, perhaps the most beautiful of all the sea-birds. It has white wings, spotted with black and grey in a manner which reminds

one of the markings of a butterfly, to which it also bears some resemblance in its graceful fluttering mode of flight.

The *Boatswain-bird* is very pretty and graceful, and has long tail-feathers like our sea-swallow.

Then there are the *Whale-birds*,—not much larger than a swallow,—of a delicate silver-grey colour on the back and upper surface of the wings, and pure white beneath. These are often seen in flocks of two or three hundred, hovering over the sea, and are supposed to indicate the presence of whales.

Last and least of all are the everlasting Mother Cary's chickens, which here abound in greater numbers than ever.

All these varieties of birds may not unfrequently be seen in the course of one day, and they give to the sea an appearance of life and animation which it would not otherwise possess in these cold and cheerless regions.

Those of my readers who wish more fully to study the natural history of the ocean will find no difficulty in providing themselves with standard works on the subject. Amongst these "The Sea and its Living Wonders," by Dr. Hartwig—a book to which I am indebted for some of the information given in the present chapter—can be confidently recommended as an amusing and instructive companion on a long voyage.

CHAPTER X.

END OF THE VOYAGE.—FUTURE PLANS.

Approaching the Australian coast—Cape Ottway—Bass' Strait—Port Phillip Heads—The "Rip"—Port Phillip harbour—Sandridge—Warehousing cabin furniture—Melbourne hotels—Deciding on length of stay in the colonies.

NO one who has not himself passed through the experience, can realize the feelings with which those who have been "cribbed, cabined, and confined" within the narrow limits of a ship, and have seen little but sea and sky and an occasional passing vessel for weeks or months at a stretch, look forward to the first sight of land when near the termination of a long voyage. For those who are visiting a distant country for the first time, there will be, in addition to the prospect of standing once more upon *terra firma*, the delightful expectation of beholding much that is new and interesting; while those who are returning to the colonies after a visit to the "old country" will be looking forward to rejoining friends and relations, and revisiting familiar scenes. Under such circumstances as these, it is scarcely to be wondered at that an undercurrent of excitement pervades the ship during the last few days of the voyage, and that the routine, which during so many weeks has been preserved in unbroken regularity, suddenly comes to an end with the first sight of land. Meals are neglected, and the passengers pass the whole of their time on deck, watching the shores, which seem

strangely beautiful to eyes wearied with the monotony of rolling waves.

Unfortunately the passenger to Australia, whose destination is Melbourne, will not see the country for the first time under its most favourable aspect, and will receive very different first impressions of the scenery of the coast to what he would have done had he sailed direct to Sydney or Hobart Town.

Approaching the Australian shores obliquely from the south-west, the captains of Melbourne traders usually aim at sighting land for the first time in the neighbourhood of Cape Ottway, at the entrance to Bass' Strait. The cape itself, which is a headland of no great height, has on its summit a lighthouse and also a signal-station, from whence the arrival of ships is telegraphed on to Melbourne. The neighbouring coast is by no means striking. In some places there are low-lying sand-hills; in others the land is more elevated, and covered with trees and dingy vegetation down to the water's edge. If it is towards the end of summer (January or February), bush-fires will very often be raging along the coast, as well as inland, filling the air, even far out to sea, with dense columns of murky smoke.

From Cape Ottway to Port Phillip Heads is a distance of sixty miles, and the run through Bass' Strait between these points may, with a favourable wind, be made in five or six hours.

However tame the coast-line may be on the north side of the Strait, there is nevertheless much in this part of the voyage to amuse those who have been long at sea. The vicinity of land, the coasting vessels and steamers, the new kinds of birds, the floating masses of seaweed, the fishing for barracouta, are all novel and interesting.

When near "the Heads," as the two points of land on either side of the narrow entrance to the harbour of Port

Phillip are called, the pilot usually comes on board ; and as his is probably the first unfamiliar face that has been seen since leaving England, he is looked at with much interest and curiosity. He is plied with questions as to the latest news from England and the colonies ; and if, as is generally the case, he has brought with him a few newspapers, these are most eagerly devoured.

"The Heads" themselves are sandy, low-lying necks of land, about a mile apart, with a lighthouse upon each. In a small bay near one of them is the pretty little watering-place, Queenscliff, which looks quite English, with its pier and rows of white houses. Here the health officer comes on board to inspect the sanitary condition of the ship.

In some states of the wind and tide there is a curious commotion of the sea in the entrance to the harbour. This is known as the "Rip," and sometimes so great is the turmoil of the waves in this narrow strait, that it is necessary to close the deadlights while a ship is passing through it. Inside the Heads the sea is comparatively smooth; but it is difficult to realise that the vessel has entered a closed harbour, for the inner low-lying shores slope away on either hand until hidden by the horizon, and in front lies an apparently unbounded sea.

This magnificent land-locked harbour is, in fact, nearly forty miles across, and the passage from the Heads to Melbourne may, if the wind be so light or unfavourable as to make it necessary to employ a steam-tug, occupy the greater part of a day. A considerable portion of this broad harbour is, however, so filled up with sand as to be too shallow for the passage of large vessels, but there are certain navigable channels which are marked out by numerous buoys and fixed and floating lights.

English vessels are usually berthed at Sandridge, one of the maritime suburbs of Melbourne, and while approaching

the pier a capital bird's-eye view of the city and its surroundings may be obtained.

As far as the eye can reach is a low, sandy bay, whose shores are for the most part lined with buildings, sometimes scattered, sometimes collected into groups; while here and there denser masses of dwellings mark the position of the more important towns and villages.

Just opposite Sandridge, on the west shore of the bay, is Williamstown; then come a number of scattered houses and villas, straggling along the water's edge and ending in a denser mass of buildings canopied with smoke and dust—this is Melbourne. Then, more thinly frayed out along the shores of the bay on the right, are the suburbs of Yarra, Sandridge, and Brighton, and further yet other little watering places down the coast as far as the eye can reach. In the foreground the shore consists mostly of low barren sand-hills, with here and there a little stunted vegetation. The background is formed by low, barren-looking hills on the horizon. Altogether, it cannot fail to strike the observer that nature has done but little to beautify the site of one of the most wonderful cities of modern times.

Sandridge is connected with Melbourne by a short line of railway, about two miles in length; and, while travelling upon it, an Englishman visiting Australia for the first time cannot fail to be forcibly impressed with the paucity of labour in the colonies. Railway porters are scarce, and they seem to have an idea that the passenger should himself deposit his luggage in the van. In fact, porterage of all kinds is very expensive, and a man will charge five shillings for conveying a barrow-load of baggage from the ship to the station at Sandridge, a distance of two or three hundred yards.

It may be as well to remark, in passing, that the passenger who intends returning to England from Melbourne, and who does not care to be encumbered with his heavy

luggage, may warehouse it for a few shillings a week at one of the outfitters' establishments that adjoin the entrance to the pier at Sandridge.*

Melbourne boasts several first-rate hotels. The two principal ones are Menzies' and Scott's. The former is a quiet family hotel, the latter rather more a bachelor's house, and situated in a more busy part of the city. In both, the cuisine, attendance and wines are excellent, and will bear favourable comparison with the best English and Continental hotels. They are, however, rather more expensive than European hotels, the average rate of living being from ten to fifteen shillings a day exclusive of wines. Besides these there are several other very good hotels, which are rather less expensive. There are also many boarding-houses in Melbourne, as there are, in fact, throughout the Colonies. In these the terms for board and lodging vary from twenty-five to fifty shillings per week.

Our invalid (who, we will hope, has derived great benefit from the voyage) having established himself at the hotel of his selection, where, no doubt, he will do full justice to the unwonted shore delicacies, thanks to the voracious appetite he has brought with him from the sea, will now have leisure to form plans for his sojourn in the Colonies.

One of the first points for his consideration will be his *length of stay on shore;* and this is a question of more importance than it might at first sight appear.

As I have started with the assumption that the reader is desirous of trying the remedial effects of the climate of the Ocean itself, and that he has not taken the voyage merely with the object of testing the Australian climate, I shall for the present confine myself strictly to the consideration of the subject from the former point of view.

* If the passenger intends to return in the same ship, the captain will sometimes allow the luggage to remain on board.

There are two objects to be borne in mind in regulating the length of stay on shore. These are : *first*, not to stay long enough to lose the benefit that has resulted from the voyage ; and, *second*, to remain sufficiently long to make a thorough break between the outward and the homeward voyage, and to gain the full benefit which *for a time* is sure to result from change of air and diet.

In several cases that have come under my own knowledge in which a sea-voyage has seemed to fail in its remedial effects, I am inclined to think that the failure has been largely due to remaining too long in the Colonies. The invalid arrives in Australia feeling better for his voyage, and finds a warm climate that appears to suit him much better than that which he has left. He is tempted to remain, and perhaps finds some occupation, or resides on a station "up country." Here he lives more roughly, and takes more violent exercise than he was accustomed to do at home. He also neglects precautions that now seem superfluous, and perhaps, led away by examples that are unfortunately only too frequent in the Colonies, he at times indulges more freely than he ought in stimulants. After a while all this tells upon him, and his constitution also becoming debilitated by the heat of the climate, he finds he is losing ground, and finally takes his passage back to England, but only after more mischief has been done than the homeward voyage is able to rectify. Of course this does not apply to all cases, but it fairly represents the history of many.

But on the other hand it will greatly aid the curative effects of the sea-voyage to remain sufficiently long on shore to ensure a thorough change. An unbroken residence on the sea of more than about three months is not desirable, on account of the monotony of the diet as well as for other reasons, and far greater benefit will be derived from the homeward voyage if it is preceded by a residence

on shore of judicious length and in a well chosen locality. There is yet another point to be taken into consideration in arranging the time that is to be spent in the Colonies —viz., the time at which the invalid will reach England at the termination of the return voyage. The best time to aim at is the late spring or early summer—namely, the end of May or the beginning of June. If the return is made sooner, the cold winds which so often prevail in the British Islands in the early spring will be found most trying after the warm weather of the tropics.

It is, of course, impossible to lay down any absolute rule in such matters, but, speaking generally, the stay in the Colonies should not be less than six weeks nor longer than three months if it is desired to give a sea-voyage a thoroughly fair trial.

During the stay on shore the diet should be as varied as possible, and plenty of fruit, vegetables, eggs, milk, etc., should be taken, so as to make the change of diet from that on board ship as marked as it can be.

The question as to the place or places to be chosen for residence while in the Australian Colonies is of equal importance with that of the length of stay. This subject will be fully considered in another chapter.

CHAPTER XI.

THE HOMEWARD VOYAGE.

Various homeward routes—Steamship routes—Sailing routes—The voyage round Cape Horn—Homeward route round the Cape of Good Hope—Limited choice of ships for this route—Its advantages for invalids—Length of passage—Course, climate, and weather—South Indian Ocean—Mauritius hurricanes—Course round the African coast—Calling at Cape Town—Course after leaving the Cape—A day at St. Helena—Island of Ascension—The Azores—Passing ships—Sunsets in the Indian Ocean—Marine Zoology—Sargasso Sea.

BEFORE deciding with reference to the homeward voyage from Australia, there will be several points to be taken into consideration by those who are travelling in search of health.

There will in the first place be several routes from which to choose :—

1. That of the Peninsular and Oriental, and other lines of steamers returning by way of India and the Suez Canal. 2. The Pacific route, by way of San Francisco or Panama. 3. The old sailing route round Cape Horn. 4. That of such sailing vessels as return to England by way of the Cape of Good Hope.

With reference to the two first routes there is but little to be said in addition to what has already been mentioned in a former chapter, when speaking of the outward voyage. Neither the Indian nor the Pacific voyages are very suitable for those whose primary object is to gain health, although both present great facilities for seeing a good deal of the world in a comparatively short space of time, and both

possess considerable attractions for those who are in search of amusement.

The Peninsular and Oriental steamers sail from *Sydney*, calling at Melbourne, Adelaide, and King George's Sound.

The various other lines of Australian steamers—such as the "Orient" line, Messrs. Wigram's steamships, etc.—which at first returned to England by the Cape of Good Hope, now adopt the Indian route for the return voyage, the passage through the Suez Canal being not only more convenient for coaling, but also much quicker than the return Cape route, with its light and contrary winds.

The Pacific mail steamers also sail from *Sydney*, and call at New Zealand ports and at Honolulu on their way to San Francisco.

The homeward voyage by way of Cape Horn was until recently almost the only one in vogue for sailing ships; and even now by far the greater number of vessels return to England by that route, on account of the prevailing winds being so much stronger and more favourable than when returning by the Cape of Good Hope; thus shortening the voyage by two or three weeks.

Homeward-bound ships bear down at once into the region of prevailing westerly winds, and taking a south-westerly course, pass Cape Horn at a parallel of about 55° to 60°.

Enough has been said with regard to the weather in the "roaring forties" to render it apparent that ten degrees nearer the pole even rougher seas, more boisterous winds, and a bitterly cold climate are to be expected. In truth the South Pacific off Cape Horn is as dismal a region of the ocean as can well be imagined. Although in the summer months (January, February, and March) there is plenty of daylight, there is then the danger of falling in with icebergs, which, however beautiful they may be as a

spectacle, are scarcely to be desired as sailing companions. In winter, on the other hand, the ice is usually fast-frozen, and is comparatively seldom encountered; but then the days are dull and dreary and very short, lasting in the depth of winter only five or six hours. At all times of the year, those who sail round Cape Horn must look for cold weather, with a temperature sometimes below freezing, heavy seas, rough winds, snow, and frequent storms. Sailors say of the gales off Cape Horn that "though they are rough they are honest," but to the majority of landsmen they will be far from pleasant.

On the whole, then, invalids, especially those who are suffering from any chest delicacy, can scarcely be advised to make their return voyage round Cape Horn, although it must be acknowledged that in some few cases the cold bracing weather appears to act beneficially.

There now remains only the homeward voyage by way of the Cape of Good Hope to be considered; and as this is the most suitable route of all for the majority of invalids, it will be more fully described than either of the others.

Unfortunately the choice of ships for this passage is extremely limited, especially now that the steam-lines have adopted the Suez Canal route. This would be of less consequence if there were a considerable number of sailing vessels from which to select; but such is not the case.

Nearly every ship that sails from Sydney, from Brisbane, or from the ports of New Zealand, returns to England round Cape Horn. The great majority of vessels from Melbourne also adopt this route; but there are one or two fine ships which sail from the latter port early in the year, and which for the convenience of invalids make the homeward voyage by way of the Cape of Good Hope. In the earlier months of the year, too, some few of the ships from Adelaide also sail by this route,—South

Australia being of course nearer the Cape, by some hundreds of miles, than the more eastern ports of Australia. If the invalid can secure a berth in one of these ships (preferably from Melbourne) he should not fail to do so, particularly if he has made the outward voyage in a sailing vessel and has derived benefit from it. He is acquainted with the mode of life on board a sailing ship, and knows both its comforts and discomforts, whereas a voyage in a steamer might not suit him, and might counteract some of the good that has already been gained.

The same remark applies to the various other routes—they are untried. The voyage round Cape Horn is cold, rough, and cheerless; and the Indian and Pacific routes not only compel the passenger to travel in a steamer, but are in themselves hot, relaxing, and in all respects unsuitable for invalids suffering from chest delicacy; whereas the homeward voyage by the Cape is, as regards climate, almost perfection.

The colonial newspapers contain advertisements of the sailings of the various homeward-bound ships, and every facility is given for inspecting those vessels that are lying in the harbours.

As full directions have already been given with reference to choosing and furnishing a cabin, and as by this time the traveller will have no doubt gained sufficient experience for his own guidance, it will be unnecessary to say anything more on these subjects. It may be mentioned, however, that both in Melbourne and Sydney there are outfitters who supply anything that may be required for the voyage back to England.

The homeward voyage by the Cape of Good Hope being the only one that can, with confidence, be recommended to invalids—especially to those suffering from chest delicacy—will call for a detailed description as regards course, climate, temperature, etc.; and those who will follow the

account of the weather given in the chapter on "Marine Meteorology" cannot fail to acknowledge that for any one in delicate health this passage is a thoroughly suitable and enjoyable one.

Owing to the light and often baffling winds which ships usually experience in that part of the South Indian Ocean through which they must sail between Australia and the Cape of Good Hope, vessels adopting this route are considerably longer on the homeward than on the outward voyage, during which they were able to take advantage of the strong, favourable westerly winds of the South Atlantic.

The average length of the voyage, even in the case of a fast sailing ship, is seldom less than from eighty-five to a hundred days. Occasionally, however, the passage extends over a hundred and twenty days, or even longer.

The tedium of this route is much diminished by the fact that ships generally call at the Cape, and in some cases at St. Helena also.

Course, Climate, and Weather.—The course of a sailing vessel returning to England by the Cape of Good Hope will, until the Cape has been passed, lie through a very different region of the ocean to that in which the outward voyage was made.

After leaving Melbourne (if the departure has been from that port), instead of sailing down into the "roaring forties," the ship will steer a course almost due west, and passing close to the south coast of Australia, will sail through the South Indian Ocean in a latitude of from 30° to 35° S. A glance at the chart will show that the track which the ship will thus follow on her way to the Cape lies just on the southern boundary of the south-east trade-wind region, or else in the calm-belt of Capricorn, between the south-east trades and the region of prevailing westerly winds. This route is chosen in order to avoid

the contrary westerly winds and rough weather met with farther south, and also to endeavour to obtain some of the advantages of the favourable trade-winds without going so far north as to deviate materially from the direct course and to get into the hurricane region. Captains, however, differ in their practice in this respect—some following the course that has been indicated, while others proceed at once well to the north, in order to get into the trade-wind region, and sail to the south again when approaching the coast of Africa.

While still near the coast of Australia the temperature, as is usually the case when in the immediate neighbourhood of land, is somewhat variable and the weather uncertain. Gales are not unfrequent, but in summer they are generally short. After getting well out to sea, however, the weather becomes settled and fine ; and day after day during the six weeks or more that are occupied by a sailing vessel in the passage between Melbourne and the Cape the remark "warm, calm and bright" is made in the log with almost unbroken regularity. With a temperature of from 65° to 72° in the shade, with a calm sea, a bright clear sky, and light yet refreshing winds, this part of the voyage is indeed most delightful to all, but more especially to those invalids who are suffering from chest delicacy, and upon whose respiratory organs the clear, pure, warm air of the South Indian Ocean exerts a most soothing and beneficial effect. But notwithstanding the enjoyment to be derived from this delightful weather, it is to be doubted if it is as invigorating to those who have strong lungs as the rougher, colder, and more bracing climate of ten degrees farther south.

The fine weather of the South Indian Ocean is, however, occasionally interrupted. Squalls of rain, accompanied by thunder and lightning, are sometimes experienced; and although the ship's course is too far south to encounter

the violent hurricanes of the North Indian Ocean, yet, when in the neighbourhood of the Island of Mauritius, cyclones of limited area are sometimes to be expected. These, though usually of short duration, are violent while they last, and are characterised by a rapid shifting of the wind. In fact, these storms form almost the only interruption to the fine weather of the homeward route by the Cape of Good Hope; but with a good ship and a careful captain, they will, if they occur, seldom prove a source of danger, while it is quite possible that the voyage may be accomplished, especially during some months of the year, without meeting with anything of the kind.

If, as is usually the case, it is intended to call at Cape Town on the homeward passage, a straight course will be steered for the south coast of Africa, which will usually be sighted for the first time somewhere in the neighbourhood of Algoa Bay, after which land will be almost constantly visible until Table Bay is reached. But even when it is not intended to touch at the Cape, ships going home by this route keep as close to the African coast as possible in order to avail themselves of the Agulhas current, which is sometimes so strong as to bear the vessel to the west at the rate of three or four knots an hour without the help of her sails.

A stay of two or three days at Cape Town not only affords a most agreeable relief to the monotony of the long homeward voyage, but also tends greatly to improve the health of the passengers by allowing of a thorough change of air and diet, and giving opportunities for obtaining exercise, the want of which is so much felt at sea. Fruit abounds at the Cape, and not only can a supply of the less perishable kinds—such as pears, apples, and bananas—be obtained, but also a good stock of fresh vegetables, poultry, etc., can be laid in for the use of the passengers.

A short description of South Africa and its climate will be given in another chapter.

After leaving the Cape the ship sailing to the north-west will soon meet with the south-east trades, and her course will take her close to St. Helena, where sometimes the captain will give his passengers an opportunity of exploring that interesting island. From thence the vessel will sail through those various regions of the ocean that have been already described until she reaches the north-east trades, when she will be close-hauled to the wind, and will often have to pass considerably to the west of her outward track. After sailing through the belt of light winds to the north of the trades, she will enter the region of prevailing westerly winds, which will carry her more or less quickly to the English Channel, near the mouth of which, however, she will frequently be baffled in the spring of the year by easterly winds.

Such is a general sketch of the homeward voyage. More detailed information as to the temperature and weather that are to be expected will be found in the chapter upon meteorology, where the observations taken during a voyage from Australia to England are given in full. It will be seen that the voyage was a long one, and as the instruments were placed under tolerably favourable conditions, the observations may be regarded as fairly correct, and as furnishing a good picture of the weather of the various regions of the ocean through which the vessel passed.

It now only remains to say a few words with reference to the special objects of interest that are met with on the homeward voyage.

Land sighted on the Homeward Voyage.—Between Australia and the Cape of Good Hope no glimpse of land is likely to be obtained. The solitary Islands of

St. Paul and Amsterdam lie several degrees to the south of the usual track of homeward-bound vessels, whereas the southern point of Madagascar, on the other hand, lies considerably to the north. After losing sight of the Australian shores, therefore, it is probable that the next view of land will (in the case of vessels bound for Cape Town) be obtained somewhere in the neighbourhood of East London, or between that port and Algoa Bay, on the south-east coast of the African continent. From thence the course lies for the most part within a short distance of land, and passes over the great sandbank known as the *Agulhas Bank*.

The colour of the sea is here dark-green, and soundings are to be obtained at a depth of from forty to a hundred fathoms. The Agulhas Bank swarms with codfish of large size; but the depth of water is, as a rule, too great for successful fishing. In the shallower parts of the bank the fish may be taken by dozens; but where the depth is from fifty to sixty fathoms, the only chance of obtaining any is to attach properly baited hooks to the heavy leads with which soundings are taken. Any lighter weight would probably fail to reach the bottom, on account of the current sweeping it away, even if the ship had no way upon her.

Between East London and Cape Town the course of a sailing vessel will generally lie too far from the coast to enable those on board to do more than make out the general features of the country, which will be seen to be undulating, with high flat-topped mountains inland, and bluff sandy cliffs towards the sea.

There are lighthouses at several points along the coast,—viz., on Bird Island and Cape Recife (the two boundaries of Algoa Bay), on Cape Agulhas, and on the *true* Cape of Good Hope, which is several miles to the east of Cape Town.

The entrance to Table Bay itself is singularly bold and striking. Table Mountain, the Lion Mountain, the Devil's Peak, and more distant ranges, form a magnificent background to the town spread out at their feet. A short description of Cape Town will be found in a future chapter.

After leaving the Cape, the first land likely to be sighted will be *St. Helena*, and as it is possible that the ship may call there, a few words with reference to the island may not be out of place.

Occupying a solitary position in the South Atlantic ocean, in lat. 15°45′ S. and long. 5°40′ W., St. Helena is 850 miles distant from the nearest land. It is ten and half miles long and six and a half broad, presents an area of about forty-seven square miles, and has a population of between six and seven thousand inhabitants. It is, of course, best known as having served as a place of captivity for Napoleon Buonaparte between the years 1815 and 1821.

Jamestown, the capital of the island, is situated in a bay on the north side, and is protected from the force of the south-east trade-winds by the high land that rises behind it. The town nestles in a beautiful gorge between two lofty mountains, and its white buildings straggle inland along the valley for a mile or more. Each point of advantage and the top of every hill bristles with fortifications.

Close to the town, on the right, a mountain rises almost perpendicularly to a considerable elevation, and up its precipitous side is constructed the celebrated flight of seven hundred and one steps known as "Jacob's Ladder."

Jamestown boasts one small inn, which is dignified by the name of the "Commercial Hotel," but its accommodation and food are of the roughest description.

Of course, every one who goes to St. Helena visits Napoleon's former tomb, as well as Longwood, the house

in which he lived during the time he was in the island. Longwood is situated on high ground seven miles from Jamestown, and it is usual to hire a carriage or saddle-horse for the journey. The road lies steeply up-hill for nearly the whole distance, and is cut in zigzags along the mountain sides. Soon after leaving the town a magnificent view of the valley in which it is situated is obtained. Looking down from this elevated position, many of the larger houses belonging to the principal people of the island are to be seen. They are surrounded by extensive gardens, the vegetation of which grows in rank and tropical luxuriance, while, high above all, the feathery crowns of magnificent palm-trees tower into the air.

On either side of the valley the hills rise precipitously, their sides clothed, in some places, with the brightest emerald green, and in others with the blossoms of thousands of scarlet geraniums which grow wild in the greatest profusion. Here and there are seen enormous aloes of various kinds and cactuses of strange form; while occasionally a canary flitting from tree to tree, or perched upon a branch singing in happy freedom, reminds the stranger that he is in tropical regions.

Longwood, Napoleon's former residence, is interesting only from its historical associations. It is a poor building, one storey high, perched upon one of the highest points in the island and exposed to the full blast of the trade-wind: the country immediately surrounding it is bleak and desolate. Napoleon's temporary tomb, on the other hand, is much lower down in the valley, and is situated in a very lovely spot. The tomb itself consists only of a rough slab of stone surrounded by clumsy iron railings.

The inhabitants of St. Helena are principally half-castes of every shade of colour. Most of them are intelligent, and nearly all speak English fluently. Although St. Helena is situated so near the equator, yet the heat is

tempered by the constant current of the trade-wind, and its climate is a very salubrious one. Epidemic diseases and fevers are almost unknown there, the only illness peculiar to the place being a form of influenza, which is very prevalent at some seasons of the year. As is the case in all islands, the climate is a humid one; but it seems admirably to suit the health of the troops stationed there, and the island is used as a health station by Her Majesty's ships engaged on the west coast of Africa.

After leaving St. Helena the next land that is likely to be sighted will be the *Island of Ascension*, another of the solitary islands of the South Atlantic. It is situated in lat. 7° 55′ S. and long. 14° 25′ W.; and as the greater part of the island consists of elevated land, rising in many places to a height of nearly 3000 feet above the level of the sea, it is visible for a considerable distance. The nearest land is St. Helena, 820 miles to the south-east. The island of Ascension is a mere volcanic rock, and has an area of only about thirty-five square miles. The principal anchorage is at Georgetown, on the north-west side. The island, which belongs to England, is used as a depôt for the Royal Marines, of whom the population, to the number of about 600, principally consists. As there are no streams or springs in the island, the inhabitants are entirely dependent for their supply of fresh water upon the rain (which is stored in tanks), or upon artificial condensation. Turtle are found in large quantities at Ascension, and fish abound round its shores. It swarms with sea birds, the eggs of which form an article of export. The castor-oil plant and the pepper plant flourish in the island.

The north-east trades will probably take the ship considerably to the west of the Cape Verd Islands and the Canaries, so that it is not likely that either of these groups

will be sighted; but the *Azores*, which lie almost directly in the track of homeward-bound vessels, are very frequently seen. The Azores, or Western Islands, are a cluster of nine islands in the North Atlantic, and are situated between 37° and 40° N. lat., and 25° and 30° W. long. The names of the islands are St. Maria, St. Michael, Terceira, St. George, Gracioso, Fayal, Pico, Flores, and Corvo. They belong to Portugal, and produce large quantities of fruit, especially oranges and lemons. St. Michael is the largest of the group, but the governor resides at Angra, in Terceira. The total population of the islands is about 214,000.

Unless very contrary winds should be encountered, it is not likely that after passing the Azores land will be sighted until the English coast comes into view, somewhere in the neighbourhood of Start Point (the most southerly portion of Devonshire), which is generally looked upon as the point of departure of outward-bound, and the point of arrival of homeward-bound ships.

Of other objects of interest that are special to the homeward voyage, it will only be necessary to mention the following:—

Passing Ships.—Between Australia and the Cape of Good Hope passing ships are rare. Those that are met with will most likely be either Chinese or Indian traders, which, after passing well to the south of the Cape, in order to take advantage of the westerly winds, are now bearing up into the south-east trades; or else small vessels bound from the Mauritius to the Australian ports with a cargo of sugar.

After leaving the Cape the passing ships met with by a homeward-bound vessel will be much more numerous, especially in the tropics, where the usual tracks of the outward-bound and homeward-bound ships intersect each

other. In the equatorial calms and the "horse-latitudes" it is not at all unusual for an opportunity to occur of boarding one or more outward-bound vessels, from which a welcome supply of English newspapers may often be obtained.

Sunsets in the Indian Ocean.—Of all the regions of the sea traversed during a voyage to Australia and back, the South Indian Ocean is that in which the most gorgeous sunsets are to be seen. Sometimes they are magnificent beyond description, and afford delight to all on board, evening after evening for weeks together. As the hour of sunset approaches, the side of the ship that faces the west is thronged with gazers, who assemble to watch the sun as he sinks below the horizon in a blaze of splendour such as is seldom to be seen except at sea and in these latitudes.

Marine Zoology.—The South Indian Ocean swarms with animal life, and the calm weather and light winds usually met with whilst passing through it present facilities for fishing for the wonders of the deep such as can scarcely be enjoyed during any other part of the voyage. Armed with nets of various sizes, and, if possible, with a microscope, the passenger who delights in natural history need never suffer from *ennui* during this part of the voyage; while the lovely weather that generally prevails renders this kind of open-air occupation particularly enjoyable.

The Sargasso Sea.—This name has been given to an arbitrary division of the North Atlantic Ocean lying between about 20° and 35° N. latitude, and extending from the neighbourhood of the West Indian Islands on the west, across the Atlantic towards the African coast as far as 65° W. on the east. It is bounded by the great currents of the Gulf Stream, which dividing into two portions enclose

in their midst a vast area of sea almost free from any currents except such as are caused by the winds. This great tract of ocean contains enormous quantities of a floating sea-weed commonly known as the Gulf-weed, but the scientific name of which is *Sargassum Bacciferum*.

Although the Sargasso Sea is, theoretically, supposed to extend almost as far east as the Cape Verd Islands, yet it is seldom that the gulf-weed is met with during the outward voyage. Homeward-bound ships, however, if driven to the west of their course by the north-east trades, often pass through large quantities of the weed. It is sometimes so thick as to appreciably diminish the speed of ships, and is occasionally so massed together as almost to present an appearance of solidity.

Naturalists consider that the gulf-weed of the Sargasso Sea is an instance of the greatest aggregation of one species of vegetation to be found in Nature. Certainly those who, day after day, have sailed through vast plains of it extending as far as the eye can reach can easily believe such to be the case.

The weed itself, which can easily be obtained from the "chains" of a ship by means of a boat-hook, is peculiar in structure, and differs in appearance from most other sea-weeds. It divides dichotomously, and the terminal branches are covered with the small berry-like fruit from which it derives its name. Not only is the Sargassum Bacciferum interesting in itself, but it also swarms with animal life, and will afford to the naturalist a rich harvest of specimens for examination. Molluscs, crustacea, sertularias, and numerous other forms of animal life are to be found in countless multitudes in these floating forests, which also form a refuge for shoals of fishes; and these in their turn attract the sea-birds which prey upon them.

CHAPTER XII.

AUSTRALIA: ITS CLIMATE, CITIES, AND HEALTH-RESORTS.

Discovery—Population, area, etc.—The aborigines—Rivers—Mountains—Government—Industries and productions—Droughts and floods—Mineral wealth—Exports—Railways—The climate of Australia generally; modifying influences—Climate of Victoria—Climate of South Australia—Climate of New South Wales—Climate of Queensland—Climate of Tasmania—Influence of the Australian climate on disease—Melbourne—Climate of Melbourne—Hot winds—Ballarat—Sandhust—Geelong—Victoria unsuitable for invalids in summer—Selection of a suitable climate—Tasmania as a summer residence—Crossing Bass' Strait—Launceston—Hobart Town—Climate of Hobart Town—Fruit in Tasmania—From Hobart Town to Sydney—Beauty of Sydney Harbour—Sydney—Climate of Sydney—Health-resorts of the interior—Queensland—Brisbane—Darling Downs—Adelaide—Climate of Adelaide.

AUSTRALIA, the vast island-continent of the southern hemisphere, appears to have been discovered soon after the year 1600 either by Dutch, Spanish, or French navigators who visited its northern shores; but maps of a still earlier date exist in which land is indicated to the south of the Indian Archipelago.

In 1642 Tasman, a Dutchman, discovered the island of Van Diemen's Land, which has since been called Tasmania; and in 1770 Captain Cook sighted the mainland in the neighbourhood of Cape Howe, and sailing along the eastern coast, first landed in Botany Bay, and afterwards planted the British flag near Cape York.

In 1787 the first batch of emigrants from England, con-

sisting chiefly of convicts and their military guard, and numbering altogether about 1000 persons, landed at Botany Bay after a voyage of eight months.

Australia measures from north to south nearly 2000 miles, and from east to west about 2400 miles ; its area is computed at upwards of 3,000,000 square miles, and though it is equal in size to nearly four-fifths of the continent of Europe, its total population is only 2,500,000. The distance from England to the nearest point of its coast is in round numbers 11,000 miles.

The whole of the Australian continent, together with some adjacent islands, belongs to Great Britain, and it has been divided into six colonies, including that of the neighbouring island of Tasmania. Although the whole of the coasts have been surveyed, the interior of the country has by no means been fully explored ; vast tracts of territory, especially towards the western side, having never been trodden by the foot of a white man. The electric telegraph, however, which connects Australia with England by way of India, completely crosses the continent from north to south.

The aborigines, a singularly degraded race of blacks, are fast dying out, and are now seldom seen in the settled districts. They live in summer in the open air, and in winter shelter themselves behind strips of bark formed into a screen rather than a hut. They practise polygamy, and have some strange customs with regard to the burial of their dead.

The rivers of Australia are, for the most part, inconsiderable, and in the dry season are mere chains of pools. The Murray, however, which is the largest of all the Australian rivers, is open for barge-traffic for a very considerable distance, and affords by its tributaries communication between South Australia, New South Wales, Victoria and Queensland.

Australia possesses several considerable mountain-ranges, of which the Blue Mountains, the Australian Alps, the New England range, the Grampians and the Darling range are some of the principal.

The government of the country is carried on by means of a Governor in each colony (who represents the British Crown), and Chambers of Legislature, two in each colony, which manage all colonial affairs subject to the sanction of the Crown.

The leading industry of Australia is *sheep-farming;* and it is to the wool thus produced in vast quantities for exportation that Australia owes its rapidly increasing prosperity rather than to its gold-fields, which although of service in the first instance by attracting labour to the colonies, are believed to have been of little permanent value to the country.

Large numbers of *cattle and horses* are bred in most of the colonies: the former chiefly for the hides and tallow; although of late years the carcases have been utilized in the preparation of preserved meat and "Liebig's" extract of beef. In 1877-78 the number of sheep in Victoria alone was computed at ten millions; while in New South Wales there were nearly twenty millions. Of cattle there were in 1876 nearly three millions in New South Wales, and more than one million in Victoria; and the number of horses at the same date was, in New South Wales 346,000, and in Victoria 200,000.

Agriculture was much neglected by the earlier colonists, but now the area under cultivation is rapidly increasing year by year, and not only is enough grain of most excellent quality grown for home consumption, but large quantities are annually exported to other countries.

The production of *wine* is much on the increase. In 1877 the quantity manufactured was 708,000 gallons in

New South Wales, and 457,000 gallons in Victoria. The wines of Australia, which are rapidly gaining public favour, are excellent in quality, and bid fair in the future to command a very extensive sale. In addition to European products, *sugar, cotton, maize, arrowroot*, and *silk*, are cultivated in some districts.

Fruits of all kinds are largely grown in the colonies. The European kinds are produced in immense quantities in Tasmania and in the more southern districts of the mainland. In the warmer localities semi-tropical fruits abound, such as the orange, banana, passion-fruit, olives, etc.

In all the Australian colonies the greatest drawback, both to pastoral and agricultural pursuits, is the prolonged droughts that occur periodically, and which often cause the death of tens of thousands of sheep and cattle from want of pasturage. These droughts are sometimes followed by floods, which are almost equally destructive, and many settlers have been ruined by both these causes; though, since the nature of the climate has been better understood, it has been found possible, by forethought and management, to provide in some measure against the disastrous effects both of droughts and floods.

The *mineral* productions of Australia are very important, and comprise, besides gold, copper, tin, silver, mercury, antimony, iron, lead, and zinc. The three latter metals are found chiefly in Western Australia. Coal-fields of great extent exist in several parts of Australia, the most important mines being at Newcastle, near the mouth of the Hunter river, in New South Wales. Kerosene is obtained in large quantities at Petrolia Vale, Hartley, and also at Wollongong. The shale from which it is distilled yields as much as seventy-five gallons to the ton.

Amongst the numerous articles exported from the various Australian colonies to Great Britain and other

countries may be mentioned the following: wool, tallow, coals, coffee, gold, tin, lead, maize, wheat, flour, leather, hides, sugar, preserved meat, timber, bark, cheese, butter, wine, live-stock, cotton, tortoiseshell, whale-oil, jams, etc.

The railways of Australia are becoming rapidly developed. In New South Wales there are three lines, two of which start from Sydney and one from Newcastle, the total number of miles open in 1877 being 598. In Victoria there were in January, 1877, no less than 933 miles of railway open for traffic, and 193 miles more in course of construction. South Australia had 291 miles open and 438 miles in course of construction at the same date. In Queensland there were, in 1875, 262 miles of completed and 88 miles of uncompleted line. Tasmania had, in 1877, about 134 miles of railway open for traffic,—the main line running from Launceston to Hobart Town.

The colonies into which Australia is divided are the following :—*Western Australia*, which occupies the whole of the western portion of the continent and is the largest of all the colonies; *South Australia*, which, since the Northern Territory or "Alexandra Land" was annexed to it, in 1863, is the second largest colony, and now occupies the whole central portion of the continent from north to south; *Victoria*, situated at the extreme south of Australia, and which, though the smallest of all the colonies of the mainland, is perhaps the most prosperous; *New South Wales*, the oldest of the colonies, occupying the south-east; and *Queensland*, occupying the north-east portions of the continent. *Tasmania* is an island lying to the south of Victoria, and separated from it by Bass' Strait.

The subjoined table will show a few leading facts with reference to each of the above-named colonies.

Statistical Table of the Australian Colonies.

Name of Colony.	Date of First Settlement.	Area in Square Miles.	Population.	Value of Exports.	Value of Imports.	Capital, with its Population.	Principal Rivers.
New South Wales	1788	323,437	662,212 (1877)	£13,125,819 (1877)	£14,606,594 (1877)	Sydney (on Port Jackson): pop. 174,249	Darling, Murray, Murrumbidgee, Lachlan, Hunter, Hawkesbury, Clarence.
Victoria, erected into a separate colony in 1850	1803	88,198	867,634 (1878)	£15,157,687 (1877)	£16,362,304 (1877)	Melbourne (on Port Phillip): pop. 251,000	Murray, Glenelg, Goulburn, Yarra-Yarra, Snowy River.
South Australia, made a Crown colony in 1841	1836	914,730	225,677 (1877)	£4,402,859 (1874)	£3,983,299 (1874)	Adelaide (on Torrens river): pop. 85,000	Murray, Roper, Macarthin, Victoria.
Queensland, made a separate colony in 1859.	1823	678,600	195,092 (1877)	£3,875,581 (1875)	£3,126,559 (1876)	Brisbane (on River Brisbane): pop. 27,000	Mary, Burnett, Fitzroy, Pioneer, Burdekin, Herbert, Mitchell, Flinders, Gilbert.
Western Australia	1825	978,300	27,321 (1876)	£373,351 (1877)	£362,706 (1877)	Perth : pop. 7,000	Swan, Murchison.
Tasmania, made a separate colony in 1825.	1803	24,600	107,104	£1,130,983 (1876)	£1,133,003 (1876)	Hobart Town (on River Derwent): pop. 20,000	Tamar, Derwent, Huon.

As the limits of a little work such as the present will not allow me to enter into anything like a general description of each individual colony, I will at once proceed to give a short account of the climate of Australia, and will then briefly describe such of the large cities and health-resorts as are most likely to be visited by an invalid. Any of my readers who may desire further information as to any of the Australian colonies cannot do better than consult any of the excellent manuals that have been compiled for the use of emigrants and others, amongst which I may mention Messrs. Silver's "Australia and New Zealand," and the Government "Colonization Circular." Mr. Trollope's graphic description of his visit to the various colonies will also be found full of interest.

The Climate of Australia.—In a vast tract of country like that of Australia it may easily be understood that the varieties of climate and the differences of temperature are almost endless. The most northern point of Queensland extends far into the tropics, to within little more than 10° of the equator; while the southern coast of Tasmania reaches to nearly 44° south latitude, or only about 6° less than the corresponding latitude of the south of England. While, therefore, the northern portions of the continent are exposed to the fierce heats of the tropics, the southern coasts enjoy a temperate climate.

But other causes besides latitude affect the climate of Australia. Thus the south-east trade-winds exercise an important influence in equalizing the temperature of the east coast of Queensland, and the climate of the more southern colonies is modified by the cool, moist southerly winds that blow from the Polar Seas on the one hand and the hot northerly blasts, desiccated by their passage over the arid wastes of the interior, on the other hand. Then again, the climate of the coast districts is very different from that

of the inland regions, the former being as a rule more humid and equable than the latter. Elevation also has much to do with the character of the climate, the high inland plains being distinguished by the dryness of the air and by the coolness of the nights as compared with the heat of the days. But besides all these general modifying influences there are local peculiarities of soil, moisture, vegetation, aspect, water-supply, etc., which are special to each locality, and which will be of much importance with regard to its adaptability to each particular constitution.

From the above remarks it will be seen how impossible it would be to deal with such a vast subject as the climate of Australia with anything like completeness; but as even a few general hints may be of service to the invalid in search of a health resort, I will endeavour to give a brief sketch of the distinctive peculiarities of climate in each of the colonies, with the exception of Western Australia, which at present is not likely to prove attractive to a casual visitor.

1. *Victoria* possesses the most temperate climate of all the colonies of the mainland. It is also very dry, even the coast regions being far less humid than those of New South Wales and Queensland. Its great drawbacks are the hot winds and the great and sudden changes of temperature to which it is subject. The south and south-west portions of the colony are at once the coolest and the least dry; while the country to the north of the dividing-range, being sheltered from the sea-breezes, is hot and very dry. The high lands in the neighbourhood of the Australian Alps are cooler on account of their elevation, and are even visited in winter by severe snow-storms. Gipp's Land, a coast-district to the east of Melbourne, backed up on the north by high mountains, is said to possess the finest climate in the colony, and to suffer less from hot winds than any other

portion of Victoria. This is probably owing to the protection afforded by the mountains at the back. The warmest months in Victoria are January and February; the coolest, June and July. The mean annual temperature in Melbourne is 57·6, but the range between the highest and the lowest of the year is very considerable, being sometimes as much as 80°, or even more. The highest recorded *shade* temperature appears to have been 115°, during a hot wind, and the lowest 28° or 29°, but the thermometer very rarely descends below 30° in Victoria, except in the high-lying inland districts. The average annual rainfall in Melbourne, deduced from observations extending over a period of fourteen years, is 25·65 inches. The greatest rainfall recorded in any one year was forty-eight inches, and the least, fourteen inches. In the coast districts more rain falls, as a rule, than in the inland districts, and the rainfall is less in the north-west portion of the colony than in any other. A few further particulars as to the hot winds and the climate of Melbourne will be given when speaking of that city.

2. The climate of the southern districts of *South Australia* is characterized by its extreme dryness. Not only is the annual rainfall very small, but the great difference between the dry and wet-bulb thermometers—amounting in some cases to as much as 40°—indicates how small is the amount of humidity in the air. In summer, the hot winds are even more trying than in Victoria, and the heat is often intense; and although the dryness of the atmosphere renders it less unbearable than it would be in more humid districts, it is very trying to Europeans. But in winter—in fact, for eight months of the year—the climate is delightful and well suited for invalids; in fact, Adelaide is one of the best winter-resorts for those suffering from pulmonary complaints that is to be found in the Australian colonies.

The following particulars as to the climate of Adelaide are taken from the "Colonization Circular" for 1877 :—

Meteorological Observations at Adelaide.	Deg.
Mean annual temperature	63·94
Mean daily range	20·98
Highest recorded shade temperature . . .	115·0
Lowest " " "	33·0
Mean annual humidity (9 a.m., 1 and 5 p.m.) . .	58.25
Mean annual rainfall	Inches. 22·763

The high-lying districts of South Australia, some of which are situated within twenty-five miles of Adelaide, are much cooler than the low-lying land near the coast, and the inhabitants of the capital are glad during the hot months of the year to escape, in some measure, from the intense heat by visiting the more elevated portions of the colony.

3. The climate of *New South Wales* is very varied. Not only does the colony extend through eight degrees of latitude, giving on this account alone a considerable range of temperature, but the differences of elevation are also very great in the various districts. In the coast-regions the climate is a somewhat humid one, the rainfall and the amount of moisture in the air being both considerable. The temperature is, however, more equable than that of Victoria, neither rising so high nor falling so low as in that colony. The hot winds are also much less trying than in Melbourne, both as regards their intensity and the length of time they continue ; but they usually bring with them clouds of dust, from which fact they have received the name of "brick-fielders," and on this account it is not advisable for invalids to remain out of doors during their continuance. In the late autumn and winter the climate is mild, equable, and delightful, and consumptives from the more southern colonies frequently pass the winter at

Sydney, or if they desire a still warmer locality, at Port Macquarie, towards the north of the colony. In the elevated plains of the interior considerably less rain falls than on the coast, but the climate even here does not attain the dryness of that of Victoria or South Australia, while the daily range of temperature is very considerable. The following table gives a few particulars as to the climate of Sydney and of Bathurst, a town situated on high ground 125 miles to the west of the capital, and having an elevation of 2,200 feet above sea-level. These two places may be taken as fairly representative of the coast region on the one hand and the high inland districts on the other :—

Meteorological Observations.	Sydney.	Bathurst.
	Deg.	Deg.
Mean annual temperature	62·9	55·8
Mean daily range	14·4	30·6
Highest recorded temperature . . .	106·9	107·0
Lowest " "	36·0	17·0
Mean annual humidity	72·7	71·6
	Inches.	Inches.
Mean annual rainfall	50·051	24·992

Although the climate of New South Wales is spoken of as being a humid one, it should be remembered that the mean annual humidity is even here far less than that of England.

4. *Queensland* possesses a climate differing in many respects from that of the other colonies of Australia. A great portion of its territory lies within the tropics, and a considerable part of its eastern coast is exposed to the south-east trade-winds. The rainy season, too, occurs in the summer instead of in the winter, as is the case in the more southern colonies. The coast districts in the neighbourhood of Brisbane, the capital of the colony, are characterized by a warm moist climate of much greater

equability than that of either New South Wales or Victoria. In summer the heat is very great, and is rendered still more oppressive by the saturation of the atmosphere with moisture from the rains that fall copiously at that season. In winter, however, the climate is comparatively dry and pleasant, and well suited to consumptive invalids. The coast regions further to the north possess all the characteristics of the tropics, and are, as a rule, unsuitable as a residence for Europeans, although even here the climate would appear to be far less trying than in many other countries in a similar latitude. The high-lying districts inland, and more particularly the Darling Downs, possess a much drier climate than the coasts ; and although, as is usually the case in all mountain plains, the range of temperature is greater than in the low-lying territories—the nights being much cooler than the days, and the heat of the sun being often very intense—yet these elevated plains of Queensland have gained a greater reputation as a winter health-resort than perhaps any other part of Australia, and many well-authenticated cases are to be met with in which a residence on the Darling Downs has been the means of curing bronchitis, and even consumption in its earlier stages. The hot winds of Victoria and New South Wales are almost unknown in Queensland, and the heat of the climate is greatly tempered and equalized by the sea-breezes derived from the trade-wind currents, which during many months of the year blow constantly upon its coasts. The mean annual temperature at Brisbane is 68·7, and the mean annual rainfall 43 inches, but a few miles inland the rainfall is considerably less. The climate of the southern coast districts of Queensland is considered closely to resemble that of Madeira.

5. *Tasmania*, which it will be remembered is an island lying to the south of Victoria, and separated from it by Bass' Strait, possesses a climate which has caused it to

be regarded as the sanatorium of the hotter colonies of Australia. The inhabitants of Victoria, and even of New South Wales, go there with their wives and families towards the close of the fierce Australian summer, as we do to the watering-places on the British coasts, for the sake of its comparatively cool air and refreshing sea-breezes, while at all times of the year invalids debilitated by the heat of the warm districts of the mainland are sent to the island by their medical advisers to regain their strength and energy.

There can be little doubt that, for the majority of Englishmen, Tasmania is better suited as a residence for all the year round than any other of the Australian colonies; and it is probable that even many consumptive invalids, if compelled to remain in *one* place during the whole year, would find this colony the best suited to their constitution.

It has been said of Tasmania that it has "a winter not more severe than that of the south of France, a summer not hotter than that of London, a spring equalling that of Montpellier, and an autumn like that of the south of England."* The mean annual temperature of Tasmania is considerably below that of the mainland, and the range of temperature is much less. The south coast, on which Hobart Town, the capital, is situated, is the coolest part of the island, and is exposed to constant sea-breezes, by which the heat of summer is greatly tempered. The hot winds of Victoria cause but little inconvenience in Tasmania, being greatly modified by their passage across Bass' Strait. For an island surrounded by vast tracts of ocean, the climate is a dry one, and the rainfall is moderate. The centre of the island is occupied by a table-land, with an elevation of about three thousand feet above sea-level, and here the air is even drier than on the coast,

* "Forty Years in Tasmania."

although the diurnal range of temperature is, as in all high-lying districts, considerable.

The following table, giving the results of meteorological observations extending over nearly thirty years, are from the "Colonization Circular" for 1877 :—

Meteorological Observations at Hobart Town.	Deg.
Mean annual shade temperature	54·72
„ diurnal range	17·91
„ annual humidity	75·0
	Inches.
„ annual rainfall	22·71

As regards the relative prevalence of the various *classes of disease* in the Australian colonies, the following facts may be of interest :—Yellow fever, cholera, and hydrophobia, are unknown. Malarious diseases are rare. Continued fevers (typhus, typhoid, etc.) are prevalent to about the same extent as in Great Britain. Diseases of the liver and of the alimentary canal (such as diarrhœa and dysentery) are rather more frequent than in England and Wales, and so also are diseases of the heart, brain, and nervous system.

But it is in diseases affecting the respiratory organs that the difference between Great Britain and the Australian colonies is most marked. In Australia these diseases do not stand at the head of the list amongst the causes of death, as they do in this country. In Tasmania, for instance, consumption stands third in the list—old age and heart diseases occupying the two first places ; and the deaths from consumption in one year amounted to less than *one-third* of the English rate of mortality.

Amongst the cases of illness treated in the Sydney and Parramatta gaols, diseases of the respiratory organs occupy about the fourth place as to frequency ; and it is highly

probable that, were it possible to obtain trustworthy data as to disease in some of the high-lying districts most favourable to those suffering from pulmonary complaints, the results would be found still more satisfactory.

The Principal Cities and Health-Resorts of Australia.—As Melbourne is the destination of most of the larger sailing vessels from England, it will be best to begin with that city, and to make it the starting-point for further travels.

Melbourne, the capital of Victoria, and the most thriving city of Australia, although not remarkable for its natural advantages, cannot fail to strike a new comer with feelings of astonishment when he remembers that some forty years ago its site was occupied by only a few wooden huts. It now has a population of over 250,000, and is rapidly increasing in extent and importance. Its streets are very wide, quite straight, and perfectly regular, and they intersect each other in every case at right angles. The principal thoroughfares run east and west, and of these Collins Street is the fashionable promenade—the Regent Street of Melbourne—and Bourke Street its great business thoroughfare.

Between the principal streets are narrower ones, which were originally intended to give access to the backs of the houses in the main thoroughfares from which they take their names. Thus there are Little Collins Street, Little Bourke Street, etc. But with the growing requirements of the city, these smaller streets have long since been alienated from their original uses, and are now lined on either side with important warehouses and offices. The shops in the main thoroughfares, although perhaps not equal to those of London or Paris, are sufficiently attractive, and the streets are busy and thronged with passengers, who look marvellously like those to be seen in any large English town, except that here there is a good sprinkling

of coloured people, and occasionally one sees a Chinaman trudging stolidly with a long bamboo over his shoulder—at each end of which is suspended a huge basket usually containing vegetables, large quantities of which are cultivated by these industrious people. Their pigtails are seldom to be seen, but they are always somewhere under their hats, twisted neatly round their heads.

The banks of Melbourne are numerous and magnificent; they are built of solid stone or granite, and many of them possess considerable architectural merit. The public buildings are large, but, for the most part, not otherwise remarkable. A huge new Government House has been built of late years, but though vast and imposing, it would scarcely strike any one as being beautiful. There is a good Public Library, open to all up to ten o'clock at night every day in the week except Sunday. There is also a University, which does not, however, provide residence for the students; and near this is a well-arranged Museum. The Post Office and the Town Hall are large and imposing buildings. As for the churches, especially those belonging to the Church of England, but little can be said in praise of their external appearance. The Roman Catholic Cathedral is the largest, and some of the Dissenting places of worship have good spires; but, as a rule, the ecclesiastical architecture of Melbourne is certainly not of a high order.

The public gardens, or parks as we should probably call them in this country, are numerous, extensive, and conveniently situated; but none of them have any of the natural advantages of site enjoyed by those of Sydney and Hobart Town. The Botanical Gardens *as* botanical gardens are excellent, and contain many rare specimens, especially of shrubs and trees; but, like the parks, they lack beauty of situation and maturity of timber.

A feature of Melbourne which seldom fails to strike a stranger is the enormous width and size of the gutters.

So wide and deep are they, in fact, that little wooden foot-bridges are placed at all the crossings, and at intervals along the streets. Even in dry weather some of them contain so much water that if the pedestrian wishes to cross one of them without going round to a bridge he will find it necessary to take a short run and to jump with some agility. But during heavy rains—and it *can* rain in Australia—the gutters become roaring torrents, and one can almost believe the legend that is told of a man who was once swept away and drowned in one! It is, I believe, a fact that children have more than once been drowned in the Melbourne gutters.

The vehicle of Melbourne is the "buggy," a kind of tilted cart on two wheels. The driver sits in front, the passengers behind, as one does in the back seat of a dog-cart: it is necessary to hold on tightly when jolting over a gutter. Melbourne is also well supplied with omnibuses.

Mosquitoes are not so plentiful in Melbourne as they used to be; but when they do occur, they usually show their preference for new arrivals, or, as the colonists would call them, "new chums." The bites are occasionally very troublesome, giving rise to much irritation, and in some cases causing sores. One of the best applications to the bites in their early stage is a lotion composed of a couple of tablespoonfuls of sal volatile to half a pint of water. Those who suffer much from the bites of these troublesome insects should always sleep within a mosquito net.

Considering its situation, close to the shores of a vast bay like that of Port Phillip, Melbourne possesses a remarkably dry climate; but it is subject, like the rest of Victoria, to great and sudden fluctuations of temperature, and in summer is liable to those terrible hot winds that are the scourge of the southern colonies of Australia. These winds are of course from the north, and traversing, in their passage from the equatorial regions, the great

central deserts of the interior, they not only become heated by the burning sands, but are also desiccated to a remarkable extent. During the time the hot wind continues, the thermometer sometimes stands at from 100° to 110° in the shade, day and night. The wind, instead of bringing with it refreshing coolness, as it does in more temperate climates, is like the breath from a fiery furnace. The inhabitants seek relief by retiring into their houses and closing every aperture that could admit the hot blast; and sometimes whole families reside in their cellars until the wind shifts to a cooler quarter. The difference between the dry and wet-bulb thermometers is often as great as from 20° to 30°, the vegetation withers, the fruit is dried up on the trees, and those who have to be out of doors suffer from a dry and parched skin. Fortunately this wind seldom lasts longer than four days at a time, and it is then succeeded by a refreshing breeze from the south; but it may be imagined that neither the hot wind itself nor the great change of temperature that takes place when it ceases, is very favourable to the health of invalids, although they suffer less from it than might be expected. The average number of days in the year during which the hot winds blow in Melbourne is said to be fourteen; but this number is often exceeded in individual years. Further particulars as to the climate of Victoria have been already given.

Those who feel any interest in the Australian gold discoveries may take the opportunity, while they are in Victoria, of visiting the towns of Ballarat and Sandhurst, distant respectively 97 and 100 miles from Melbourne. There are lines of railway to both these places; and they are both interesting, not only on account of their association with the gold-rush of 1851, but also from the extensive mining operations carried on at the present time. At Ballarat the gold is "alluvial," and the machinery attached

to the mines is directed to the raising and washing of the dirt amongst which the grains of precious metal are found scattered. At Sandhurst (which was formerly known as Bendigo) the gold, on the other hand, is found imbedded in quartz, which is crushed to powder by powerful machinery, and the gold afterwards separated by means of mercury, with which it forms an amalgam. Finally the mercury is driven off by distillation, leaving the solid metal behind. Ballarat is a thriving town, with a population of 25,000, and Sandhurst at the last census had 22,000 inhabitants.

A visit may also be paid to Geelong, a port situated on the south-western shores of Port Phillip harbour, not very far from its entrance. A railway, forty-five miles in length, connects it with Melbourne. Its population is about 16,000.

A few days will be found sufficient for seeing all that is of interest in Melbourne itself, and a week or so may be devoted to visiting other places of interest in the colony; and then the invalid who is really travelling for his health, and who is content to make that his first object, must take his future plans carefully into consideration. In coming to a decision, several circumstances will have to be borne in mind—such as the time of year, the constitution of the patient, and the length of time he has decided to remain in Australia.

From the short account that has been given of the climate of each of the principal colonies it will be seen which of the districts mentioned is most suitable as a summer, and which as a winter residence. The previous experience of the invalid himself, and the advice of his medical advisers, will also do much to lead him to a decision as to the nature of the locality he should choose, —whether it should be a coast or an inland district, a dry

or a humid climate, etc. But in the case of an invalid who, having left England, say, in October, has arrived in Australia in January or February (*i.e.* the hottest part of the year), and is sufficiently well to enjoy a moderate amount of travelling,—particularly if he does not intend to remain in the colonies more than three or four months, —I should by no means advise a lengthened stay in Melbourne, which possesses but an indifferent summer climate, and is in many respects not a very desirable residence for those in delicate health.

The best course will be at once to cross over to Tasmania, where the remainder of the summer can be spent healthfully and pleasantly; and in the autumn to go on to Sydney, Brisbane, Adelaide, or any of the other principal cities that it may be desired to visit, returning to Melbourne in time to embark for the homeward voyage. In this way each of these localities will have been visited at the season of the year in which its climate is most suitable for those in delicate health. I will, therefore, at once accompany the reader on a visit to Tasmania, the great health resort of the Victorians, and in some cases also of the inhabitants of the more distant colonies.

Tasmania is separated from Victoria by Bass' Strait, a channel about 102 miles across—the actual sea passage by steamer only occupying about twelve hours. Steamers run from Melbourne to the ports of Tasmania two or three times a week; and those who intend to visit the island cannot do better than take their passage to Launceston, the most northern and nearest of the ports, taking care to secure their berth two or three days in advance. The steamers—although, perhaps, rather too small for comfort, considering the rough weather that is sometimes met with in the Strait—are in other respects commodious and handsome little vessels, and are both well fitted and well

found. They start from a wharf on the Yarra-Yarra—the river upon which Melbourne is situated—and follow its windings for a mile or two before emerging into the open bay of Port Phillip. The Yarra, as it is called for shortness, is but a narrow, insignificant little stream, muddy, low-banked and tortuous, and presenting nothing of interest except some wool-scouring establishments and a few manure-works, which add but little to the pleasure of the passers by. Port Phillip harbour; which has now to be crossed, has been already described; its passage by steamer occupies only from three to four hours. In passing through the "Rip" in a small steamer its peculiarities are much more evident than in a large sailing vessel. Here sea-sickness lays hold of unaccustomed voyagers; and even the passenger who has just landed from a three months' voyage must not be surprised if he also falls a victim to the malady—so different is the motion of a small steamer from that to which he has been accustomed, and so trying is the vibration of the screw.

As the steamers for Tasmania generally sail from Melbourne in the afternoon, it will be late in the evening before they have passed through Port Phillip Heads and emerge upon the open sea in Bass' Strait, and by this time those who feel sea-sick cannot do better than turn in for the night. In the morning, if the run during the night has been a tolerably good one, the coast of Tasmania will be visible, and will be found far more interesting than that of the opposite mainland. Soon the mouth of the river Tamar will be entered, and a series of very beautiful views will present themselves in a constantly changing panorama, until the steamer, after following the windings of the river for about forty-five miles, arrives at Launceston. Trees and shrubs, strange to European eyes, line the water's edge in endless variety, and strange birds flap lazily overhead, or stand on long stilt-like legs upon the sand-

banks that run out into the stream. Human habitations are few and far between, and when they occur consist mostly of solitary log-built huts.

Launceston, although it boasts a population of some 12,000 inhabitants, is a very deserted-looking town. The houses are for the most part poor and the gardens ill kept; but there are a few good buildings, of which the post-office is one. There are several churches belonging to various denominations; public gardens, and two or three small hotels, of which the "Launceston Hotel" is probably the best, although even that is (or was) but a primitive establishment, with a *table d'hote* dinner at one o'clock and a tea at six. Launceston prides itself upon being well supplied with water and gas, and upon its English appearance generally; but its streets are dull and deserted, except on Saturday nights and on public holidays, when its inhabitants turn out in force.

The lion of Launceston in the way of scenery is the "Cataract," as it is called—a term likely to raise expectations that will scarcely be realized. A craggy valley, between two high hills of basaltic rock, with a slender stream, which, rushing over rocks and boulders, churns itself into foam, is what is really to be seen. The climate of Launceston is much superior to that of Melbourne—in the summer, at any rate—for it is cooler, and the hot winds, being tempered by their passage across the Strait, reach the island only in a mitigated form. A local handbook says: "Launceston may be called a city of calms. Lying in a bay of hills, high winds and thunderstorms are very rare, and facing northwards so that the sun's rays have full effect all day, in spite of occasional winter fogs, it is a remarkably dry and healthy town."

But there is little to tempt any one to make a prolonged stay in Launceston, and it will be better after a day or two to push on to Hobart Town.

The journey thither can, I believe, now be performed by railway; but at the time I was in the island the only communication between the two towns was by coach, and should the coaches still run I should strongly advise the reader to choose that mode of conveyance. It affords infinitely better opportunities for seeing the scenery and wayside features of colonial life, and is altogether more enjoyable.

Driving out of the town between the high sweetbriar hedges, for which Tasmania is celebrated, the coach soon reaches high ground, and a panorama of fine mountain scenery opens out on the left. Then comes a forest of "gum-tree scrub," lasting for many miles; and by this time the passenger will have discovered that the road along which he is driving is a very fine one—the finest in the colonies, in fact—and equal to any turnpike-road in England. The whole of the road between Launceston and Hobart Town was formed by convict labour, and not only is it admirably constructed, but it is planned with considerable engineering skill.

The journey between Launceston and Hobart Town by coach can, if desired, be managed in one day, but it will be better and less fatiguing to take two days about it. The usual halting-place is Campbell Town, distant forty miles from Launceston. Several villages are passed on the way; and although some of them appear to consist of no more than half a dozen tiny cottages and the inevitable public-house or "hotel," yet they are spoken of as towns and dignified by pretentious names such as Cleveland, Breadalbane, etc.

The road ascends all the way to Campbell Town, a place which boasts a population of some 1,600, and which is considered by the Tasmanians to be quite an important town. It is situated on the table-land of the interior, at an elevation of about 1,500 feet above sea-level, and the

air here, although cold at night and in the early morning, is beautifully clear and bracing; and those who have plenty of time, and who wish to explore the central and eastern parts of Tasmania, may with advantage stay here for two or three days. The "hotel," though small and primitive according to English notions, is clean and tolerably comfortable. Although Campbell Town is only one-third of the total distance (121 miles) between Launceston and Hobart Town, yet it really divides the journey with tolerable fairness on account of the long ascent before reaching the high ground on which it is situated.

After leaving Campbell Town, the scenery changes and assumes a more sylvan character. The English traveller might now almost fancy that he is passing through some of the rich valleys of Cornwall and Devonshire, were it not that flocks of brilliantly-coloured parrots and parroquets, or of screaming white cockatoos, constantly remind him that he is in a foreign land.

There are, however, immense numbers of veritable English rabbits, which, although they were introduced into Tasmania only a few years ago, have increased to such an enormous extent as to interfere seriously with the cultivation of the land. Lately, I believe, science has been brought to bear upon the subject in the shape of dynamite, with which the unfortunate rodents are blown to pieces in their burrows.

The names of the towns (!) that are passed in the latter part of the journey are somewhat "mixed." There are Bagdad, Lemon Springs, Green Ponds, Melton Mowbray, Brighton, Jerusalem, Jericho, while near the road are the River Jordan and the Lake of Tiberias!

Many miles before reaching Hobart Town the towering summit of Mount Wellington comes into view, and the road soon descends into the valley of the Derwent, where glimpses of beautiful river scenery are from time to time

obtained. The country is here much more closely populated than during the first part of the journey, and pretty houses and farms dot the sides of the hills in increasing numbers as the capital of the island is approached.

Hobart Town will, I think, strike any new comer as being a lovely city. It is situated upon the shores of a harbour, formed by the estuary of the Derwent, which, although not so large as that of Sydney, is scarcely inferior to it in beauty. On every side rise lofty mountains with finely-wooded valleys between them. The town itself is built upon the sides of hills which slope gently down to the quays and warehouses lining the water's edge. Mount Wellington, 4,166 feet in height, appears to rise just behind the town, but its summit is in reality some ten miles distant. On the opposite side of the estuary is Mount Nelson, of inferior height, but very picturesque, rising above a beautiful inlet of the harbour called Sandy Bay.

The town itself, which contains a population of upwards of 20,000 inhabitants, is very English in appearance, and has several streets of good width, in which are to be found the principal shops and public buildings. Except in the main thoroughfares the houses are for the most part but one storey high, with wooden verandahs and pretty gardens, in which our own choice plants, such as geraniums, fuchsias, roses and calceolarias flourish in great luxuriance. Interspersed amongst these, however, are more unfamiliar plants—such as large grotesque-looking cactuses and various indigenous flowering shrubs, while on every hand are the eternal stiff, scraggy gum-trees. The Government House at Hobart Town is certainly the handsomest and the most beautifully situated, if not the largest, of any in the colonies; and the other public buildings are commodious, if not imposing. There is a new cathedral in the Gothic style, and the services there are remarkably well conducted.

As is usual in all colonial cities, there is a public park. At Hobart Town it is called the "Domain"; and is large, undulating, well timbered, and splendidly located near the shores of the harbour.

The hotels in Hobart Town are good, and less expensive than in Melbourne; there are also several boarding establishments, where comfortable accommodation can be obtained.

The climate of Hobart Town, the favourite health resort of Tasmania, has been already described as not only remarkably dry, considering the position of the town and the small size of the island, but also as being much cooler than either Melbourne or Sydney. Particulars as to meteorological observations taken at the observatory have also been given. Although the middle of the day may be sometimes hot, yet the evenings and nights are usually cool and bracing. The hot winds of the Continent are felt here even less than in the north of the island, and when they occur seldom last more than twenty-four hours; but sometimes during that time the thermometer stands as high as 90° in the shade. This is, however, exceptional, the usual range in summer being from 55° to 75°. As a rule, I think those with delicate chests will feel more inclined to complain of the coolness than of the heat of Hobart Town; not that the temperature is actually low, but that there are often somewhat sudden changes from heat to cold that may be found trying. The Tasmanian winters, although, of course, colder than in the more northern colonies, are on the whole beautiful, and far more equable than the summers. The same remark applies to the autumn; and some of the inhabitants maintain that there is really no true summer in Tasmania, only a prolonged spring that merges into autumn.

On the whole the climate is a delightful one, and perhaps the best that is to be obtained within an easy distance of

Melbourne; while its many natural beauties, and the comforts that are within the reach of an invalid, render Hobart Town as pleasant a place of sojourn as can be met with in the Australian colonies.

Those who feel inclined to do so may fill up their time very pleasantly by excursions to the many places of interest in the neighbourhood; and any one who wishes to see the heart of an Australian forest, with its gum-trees 250 feet in height, and its tree-ferns twenty or thirty feet high, should not miss the opportunity of making the journey by coach to the Huon river.

Letters of introduction will ensure the visitor a hearty welcome at Hobart Town, and the society there is remarkably pleasant and English-like.

In enumerating the advantages of Tasmania as a residence, I must not forget to mention its comparative freedom from mosquitoes, and also the great abundance of its fruits. Some districts of the colony resemble a vast orchard, in which are grown apples, pears, cherries, plums and other European fruits, in such quantities that it is often impossible, owing to scarcity of labour, to gather them when they become ripe, and they are allowed to drop from the trees. Preserves are made in vast quantities, and exported to neighbouring colonies; and would be manufactured to even a larger extent, were it not that a heavy duty is imposed upon them.

Those who wish during their stay in the colonies to visit the capital of New South Wales can reach it easily by steamer either from Melbourne or from Hobart Town. The time occupied by the voyage is nearly the same in either case—viz., from two to two and a half days. The Melbourne boats are, however, larger and more punctual than those of the Tasmanian line; but both are equally well found as regards provisions and attention to the

comforts of the passengers. The coast-scenery both between Melbourne and Sydney and Hobart Town and Sydney is interesting to a stranger; but in the latter route less land is visible than in the former. The coast is for the most part mountainous and barren; and in the summer, when the season is a dry one, hundreds of bush-fires are to be seen raging amongst the gum-tree forests. As the neighbourhood of Port Jackson is approached, the scenery becomes more bold and striking; and after passing through the narrow entrance to Sydney harbour, with its rocky "Heads" only three-quarters of a mile apart, the view that opens up is one of the most beautiful that can be imagined. The calm, smooth expanse of water stretching away into numberless bays and coves; the rocky points, sometimes bare and rugged, sometimes clothed with foliage down to the water's edge; the lovely little islands, and the picturesque villas half hidden in semi-tropical vegetation; and, lastly, the imposing city in the distance, with its white houses and tall spires—all combine to form a picture of dream-like loveliness scarcely to be equalled throughout the world.

Anthony Trollope appears to have been greatly struck with the beauty of Sydney harbour. He thus speaks of it:—"I despair of being able to convey to any reader my own idea of the beauty of Sydney Harbour. I have seen nothing equal to it in the way of land-locked sea-scenery—nothing second to it. Dublin Bay, the Bay of Spezzia, New York, and the Cove of Cork are all picturesquely fine. Bantry Bay, with its nooks of sea running up to Glengarrif, is very lovely. But they are not equal to Sydney, either, in shape, in colour, or in variety. I have never seen Naples, or Rio Janeiro, or Lisbon; but from description and pictures I am led to think that none of them can possess such a world of loveliness of water as lies within Sydney Hea 's. The proper thing to assert is

that the fleets of all nations might rest securely within the protection of the harbour. How much acreage of sea the fleets of all nations might require I cannot even surmise; but if they could be anchored together anywhere they could surely be so anchored at Sydney. . . . I doubt whether I ever read any description of scenery which gave me an idea of the place described, and I am not sure the effect can be obtained in words. . . . I know that the task would be hopeless were I to attempt to make others understand the nature of the beauty of Sydney Harbour. I can say that it is lovely, but I cannot paint its loveliness. The sea runs up in various bays and coves, indenting the land all around the city so as to give a thousand different aspects of the water—and not of water broad, unbroken, and unrelieved, but of water always with jutting corners of land beyond it, and then again of water and then again of land. And you—the resident—even though you be a lady not over strong; though you be a lady, if possible, not over young, will find, unless you choose your residence most unfortunately, that you have walks within your reach as deliciously beautiful as though you had packed up all your things and travelled days and spent pounds to find them."

The City of Sydney, with its suburbs, is built upon the shores of numerous bays, coves, and creeks, and presents none of that unity of design that is seen in the arrangement of Melbourne. The streets are in many cases irregular and sometimes narrow, but there are nevertheless some fine business thoroughfares, and these, as well as the shops themselves, have a far more English appearance than those of the capital of Victoria. It is easy to see, too, that Sydney is by far the older city, for here are many traces of the first beginnings of the settlement, and indications of the manner in which it has been added to from time to time. The suburbs, particularly the more modern and fashionable ones, such as Darlinghurst, are exceedingly

picturesque, and are built upon jutting points and upon the shores of bays, and most of them command lovely views of the harbour. Some of the more important of the suburban residences are very beautifully situated, and are surrounded by grounds in which everything that can be done by art to enhance their natural advantages has been done.

Sydney boasts some fine public buildings. The Government House, although not so handsome as that of Hobart Town, nor so pretentious as that of Melbourne, is much older than either, and is very beautifully situated, with a little bay of the harbour all to itself. The Cathedral is quite new, and is a large building in the Perpendicular style, with a central as well as western towers, and makes a fine architectural addition to the *coup d'œil* of the city. The Town Hall, also new, is an imposing structure ; and the new Post Office is a great improvement upon the old one, which was a wretched building. The Museum is perhaps the finest in the colonies, and contains most interesting zoological, ornithological, conchological, entomological, and mineralogical collections, besides many other objects of interest. The University is in one of the suburbs of Sydney. It is a large and imposing building, and has a very fine hall, with a handsome carved oak ceiling, and some very good stained glass. The students are non-resident. The botanical gardens are very beautiful both as to situation and arrangement. They are placed in a magnificent position, overlooking Sydney harbour, and contain, in addition to a fine botanical collection, many interesting specimens of live animals and birds.

Although Sydney is the parent-city of the colonies, it does not contain nearly so many inhabitants as its younger rival Melbourne. At the last published census its population was only 174,249, whereas that of Melbourne was 251,000.

There are many places of interest in the neighbourhood of Sydney. The Parramatta river, which empties itself into Sydney harbour at its western extremity, is navigable by small steamers for a considerable distance, and affords some fine river-scenery. The small town of Parramatta, at which the steamers disembark their passengers, is celebrated for its extensive orange-orchards, which when in blossom or covered with fruit present a lovely spectacle.

Near the North Head, at the entrance to the harbour, is Manley Beach, a small watering-place and favourite health-resort during the hot months of summer. The main street of the village passes across the neck of land which here divides the harbour from the ocean. At one end it opens upon a calm land-locked bay; at the other upon the surf-beaten shore of the open sea.

Some little idea of the vast extent of Sydney harbour may be obtained from the following statement put forward by some of the colonists with a view to astonishing new-comers. They say that if a man were to start from the South Head, and were to walk round the shores of every bay, creek, cove, inlet, river, and estuary, he would have traversed upwards of a thousand miles before arriving at the North Head! This estimate must probably be taken *cum grano salis*; but any one can see for himself that the coast-line is enormous.

The hotels of Sydney are less pretentious than those of Melbourne, and much less expensive. One of the oldest-established, and perhaps the best, is Petty's Hotel, a very comfortable, homely house, where you are aroused in the morning and called to meals by a great bell which, vigorously rung through the corridors, carries you back to your youthful school-days. Boarding-houses are numerous both in Sydney itself and in the suburbs; at these the charge for board and lodging, exclusive of wine, etc., is about 30*s.* per week.

Fruit is exceedingly plentiful and very cheap at Sydney. Besides those grown in its own neighbourhood, it is plentifully supplied from Tasmania with the English fruits, and from Queensland with the semi-tropical kinds. At some of the hotels I have seen great bowls of fruit placed on the table in which were to be found grapes, bananas, passion-fruit, oranges, guavas, pine-apples, peaches, apricots, nectarines, pears, and apples, besides other varieties.

The climate of Sydney, though more equable than that of Melbourne or Tasmania, and not liable to hot winds to so great an extent as the former, is, as has been already seen, more humid than either. Although the temperature seldom rises above 90°, the *sensation* of heat is sometimes very great, and the comparative dampness of the atmosphere, not allowing of the free evaporation of moisture from the skin, sometimes produces the unpleasant sensation of being in "a bath of perspiration." But often, when the heat is at its greatest, the wind will suddenly veer to the south, and there comes up, with little warning, a great storm, often accompanied by hail, rain and lightning, familiarly known to the colonists as a "southerly burster." The temperature at once falls some 20° or 30° with most refreshing effects, but with some little danger as regards those who are susceptible to sudden changes.

But notwithstanding these drawbacks, the climate of Sydney is, for many months of the year, a very enjoyable one for those in health, and suits even some invalids admirably. Sometimes in the autumn, for weeks together, there is scarcely a cloud to be seen, and days of brilliant sunshine, tempered by a refreshing breeze from the sea, succeed each other with unbroken regularity. The winters in Sydney are also very beautiful, and far more healthful than the summers.

For most consumptive and bronchitic invalids, however, Sydney possesses a climate too humid and relaxing to

render it a suitable residence except for a short time, and it will be desirable to proceed without unnecessary delay to one or other of the elevated inland districts of the interior. A visit may be paid to the Blue Mountains, or the high-lying plains beyond. A railway, which is quite a triumph of engineering skill over natural difficulties, has been constructed at a great expense over the Blue Mountains to Bathurst, a town built at an elevation of 2,200 feet above sea-level, particulars as to the climate of which have already been given. The railway ascent is by a series of zigzags, and the views of mountain scenery obtained from them are very fine.

Another line of railway goes to Goulburn, which also lies high upon a spur of the mountain range, and has a good climate.

Another high-lying district and health-resort is that of Liverpool Plains, easily reached from Newcastle, the seaport which supplies Sydney with coal. A voyage by steamer of some seven hours takes the passenger to Newcastle, and from thence there is a railway direct to Liverpool Plains.*

Brisbane, the present capital of Queensland, is situated about 500 miles north of Sydney, from which it is reached by the usual means of inter-colonial communication—viz., by steamer. The town is prettily situated upon a river of the same name, and has a population of about 20,000 inhabitants. It has well-laid-out public gardens, and the usual public buildings found in all the capitals of the colonies—viz., a government house, houses of parliament, courts of justice, a museum, churches belonging to various denominations, etc., etc. The heat and humidity of its

* In each of these districts there are numerous towns, in most of which fair accommodation can be obtained, as well as medical attendance.

climate at most seasons of the year render it an unsuitable residence for invalids, who should at once proceed to one or other of the high-lying towns or stations situated upon the Darling Downs, a district which amongst all the highlands of Australia has perhaps gained the greatest reputation as a health-resort for cases of chest-disease. There is a railway as far as Warwick, which has the name of being one of the prettiest towns in Queensland.

Adelaide, the capital of South Australia, is situated in the Great Australian Bight, about 550 miles west of Melbourne, and is within easy reach of the latter place by means of steamers which run two or three times a week. The capital is eight miles from the seaport, which is called Port Adelaide, and is itself a place of some importance. The city of Adelaide is pleasantly placed in a plain, with a background of hills rising towards the north. The Torrens river, upon which the town is situated, is during eight or nine months of the year little more than a dry watercourse, but in the rainy season it becomes quite a torrent. The city is built with the greatest regularity, the general arrangement being even more rectangular than that of Melbourne. All the streets run either north and south or east and west, and there is no deviation from this general plan. It has a government house, houses of parliament, a town-hall, and a particularly fine post-office, of which the inhabitants are justly proud; besides which there are banks, hospitals, orphanages and other public buildings. It is also very abundantly supplied with churches belonging to all denominations. The water supply of Adelaide is particularly good, and the streets are well lighted with gas.

The climate of Adelaide is, as has been already shown, remarkable for its dryness, and is said much to resemble that of Sicily or Naples. During eight or nine months of

the year it is delightful as a residence; but in the three summer months—December, January, and February—the heat is often very intense, the thermometer not unfrequently rising as high as 110° or 115° in the shade, while the hot winds which then prevail do not tend to improve matters. But even in the hottest weather relief may easily be obtained by visiting some of the high districts which are within very easy reach of the city—such as Mount Lofty, which is only eight miles, or Mount Barker, twelve miles from Adelaide; and at either of which the thermometer will stand many degrees lower than in the plains.

The rainy season at Adelaide is in the winter, but an Englishman would probably regard the weather that then prevails as resembling a rainy summer in England rather than winter; and as the total annual rainfall is but small, and in some years little or no rain falls even in the rainy season, no one is at any time likely to find the amount of moisture excessive.

Such is a sketch—necessarily slight and imperfect—of the principal cities of Australia; and it is hoped that enough has been said of the climate of each to enable an invalid, making only a short stay, to choose his places of sojourn judiciously and at the same time to see as much as possible of the colonies. To those who intend to *remain* in Australia I will not here attempt to offer any advice beyond mentioning the general fact that, as a permanent residence for consumptive or bronchitic invalids, the high-lying plains of the interior have been found far more favourable than the coast districts of the various colonies.

CHAPTER XIII.

SOUTH AFRICA AND ITS CLIMATE.

Districts comprised in South Africa—Cape Colony—Population—Rivers—Mountains—Industries and productions—Exports—Ports—Cape Town—Suburbs of Cape Town—Railways—Cape wines—Port Elizabeth—East London—Natal—Durban—Pietermaritzburg—Orange Free State—Elevated plains of the interior—Bloemfontein—The Transvaal—Climate of Cape Town and its neighbourhood—The "Cape Doctor"—Health-resorts of the interior—Graham's Town—Cradock—Colesburg—Bloemfontein—Conveyances—Cobb and Co's coaches—Passenger carts—Mail carts—Private conveyances—Ox-wagons—Climate of the inland plains; its dryness—Thunderstorms—Droughts—Meteorological observations—Influence of the climate on disease.

FOR the information of those who have chosen the voyage to the Cape of Good Hope in preference to the longer Australian passage, it is proposed to give in the present chapter some little account of South Africa and its climate, with special reference to those localities that have been found most suitable for invalids. It will, of course, be impossible to do more than give a brief outline of the subject, but even a few hints may prove of service to those who intend making some little stay at the Cape before returning home.

The term *South Africa*, in its widest sense, includes several colonies and districts situated in that portion of the African continent which lies to the south of 22° S. lat. It comprises the following territories, viz. :—

1. The colonies that belong to Great Britain—viz., *Cape Colony* (including the incorporated provinces of British Kaffraria, Griqualand West, and British Basutoland), *Natal*, and the *Transvaal* (annexed in 1877). In addition to these there are certain irregular districts, virtually British, situated in Kaffirland (or Kaffraria), and known collectively as the "*Transkeian Territory*."

2. An independent Dutch republic, the *Orange Free State*.

3. Countries inhabited by and still under the dominion of native tribes—viz., *Kaffirland, Zululand*, etc.

4. Certain *Portuguese possessions* in the neighbourhood of Delagoa Bay, to the north of Natal.

It will only be necessary for the purposes of the present work to glance briefly at three or four of the colonies that have been enumerated above—viz., Cape Colony, Natal, the Orange Free State, and the Transvaal. The rest are of comparatively little importance to any one visiting South Africa only for a short time, or as an invalid.

Cape Colony comprises that somewhat triangular portion of the African continent which is bounded by the South Atlantic and South Indian oceans on the south-west and south-east respectively, and by the Orange river on the north. The extreme length of the colony is 770 miles, and its breadth 470.

The entire population is about 720,000,—of whom about 236,000 are Europeans; 11,000 Malays; 98,000 Hottentots; 73,000 Fingoes; 214,000 Kaffirs or Bechuanas; and 87,000 mixed and various races. The European inhabitants of the colony are of several nationalities, and comprise a large number of Dutch boers or farmers, many of them the descendants of the original Dutch settlers, by whom the country was held with but little interruption until the beginning of the present century.

In addition to these, the Colony contains English, German, French, and Portuguese inhabitants, besides others of various races.

The rivers of Cape Colony are, for the most part, unimportant, the want of navigable and perennial streams being one of the great drawbacks to South Africa. Although in the rainy season they are often raging torrents, at other times many of them are little more than detached pools of water ; and the estuaries, even of the largest, are mostly filled up with sand, rendering them useless for purposes of navigation. The most important of the rivers of Cape Colony are : Orange river, Oliphant's river, the Breede, Gamtoos, Gauntz, Sunday's river, Great Fish river, the Keiskamma, Buffalo, Kei, and Bashee rivers. The four last are perennial streams.

The mountain systems of the Colony are of considerable importance to those seeking a health-resort, because upon them depend the differences in the elevation and climate of the various districts. In the southern portions of the Colony the land, as it recedes from the coast, rises in a series of natural terraces until, at an average distance of about 130 to 150 miles from the sea, a system of lofty mountain ranges is reached, which crosses the southern portion of the continent from east to west, and has been called the "Backbone of Africa." On the north of these mountains are situated the highest districts in the Colony. But before reaching the "backbone of Africa" one or more secondary parallel ranges of mountains will have been crossed, and all of these, including the highest, act, as it were, as retaining-walls or buttresses to the elevated plains beyond them, for they slope steeply and precipitously towards the south, but very slightly, if at all, towards the north. It is to this peculiar configuration of the country that the great dryness of the more elevated plateaux is partly due, for the damp winds blowing from the sea

deposit their moisture on the southern face of the mountains in the form of rain, which goes to feed the rivers of the districts below. The communication between the tracts of country of different elevations is by means of roads constructed with much skill through the narrow passes or "kloofs" which pierce the mountain ranges at intervals. The high-lying districts to the north-east of the Colony are those that have been found most suitable for chest complaints requiring a dry climate. The Nieuwoeld, the provinces of Cradock and Colesberg, and the districts extending northwards towards the diamond fields, are the localities that have been most recommended.

The natural resources of the Colony are considerable. Besides agricultural pursuits, the farmers of the Cape are engaged in rearing large numbers of *sheep*, *cattle*, and *horses*, for the pasturage of which the grass lands of the interior are admirably suited. *Ostrich farming* is also becoming a favourite pursuit, and appears to be profitable. In 1875 there were some 22,000 birds in the colony. A pair of breeding birds is worth as much as £150, and the artificial incubation of the eggs is now practised to a considerable extent. *Wine making* is carried on principally in the neighbourhoods of Constantia, Stellenbosch, Worcester, Robertson, and Oudtshoorn. *Tobacco*, *cotton*, and *coffee* are grown in some districts, but, with the exception of tobacco, not to any great extent. The *fruits* of the Cape are various, and include oranges, citrons, guavas, bananas, peaches, apricots, plums, quinces, grapes, etc. *Grain* is raised in large quantities, and the wheat of South Africa is amongst the best in the world. *Game* of all kinds is still plentiful in many of the inland districts, and the botanist will find an immense field for research in the varied and beautiful *flowers* and *trees* of the colony.

The *diamond fields* are situated in Griqualand West, which was formerly a separate colony, but in 1873 was

incorporated as one of the provinces of Cape Colony. The diamond diggings are of two kinds, known as "river diggings" and "dry diggings." The former extend along the banks of the Vaal river between Hebron and Sifonel; the latter are included within a radius of little more than two miles in the neighbourhood of Kimberley, which is the principal town and the seat of magistracy of the district. The largest diamond yet found weighed 288 carats. By a glance at the map it will be seen that the diamond fields are situated at the extreme north of Cape Colony, and although the climate is a good one the length and difficulties of the journey render it unsuitable for an invalid.

The most important *exports* of Cape Colony are copper, corn, aloes, ostrich feathers, cured fish, dried fruits, hides, skins, ivory, wine and brandy, wool, diamonds, etc.

The principal *ports* of Cape Colony are Cape Town, and Port Elizabeth, in Algoa Bay; other ports, at present less important, are East London and Port Alfred. It will only be necessary to describe the first three.

Cape Town, the capital of Cape Colony, is built on the sloping shores of Table Bay, which, although an open roadstead, is so enclosed and protected by surrounding hills and mountains, and by an island—Robben Island—as to afford secure anchorage for vessels even of the largest size in all ordinary states of the wind.

A large breakwater, which has been constructed at great expense, affords additional security.

Immediately behind the town rises in bold relief the singular flat-topped mountain so universally known as Table Mountain,* and on its right and left are the Lion Mountain and Devil's Peak, while other mountains stretch away in rugged succession as far as the eye can reach.

The streets of Cape Town are, for the most part,

* 3,582 feet in height.

tolerably regular and of good width. Many—perhaps I should say most—of the houses have been built by the Dutch settlers, and some are of venerable age and picturesque appearance. With the exception of these, Cape Town possesses very few buildings, either public or private, of much interest to the stranger. Besides the English, Dutch, and Roman Catholic Cathedrals, there are many churches and chapels, none of which, however, possess any architectural pretensions. The Market Place is a large open space, surrounded by a few handsome buildings—principally banks, warehouses, and shops. The Public Botanical Gardens are pretty, home-like, and well-timbered. Facing these is the Government House—a homely old-fashioned brick building, beautifully covered with luxuriant creepers and surrounded by lofty trees. Near the Government House is a large building containing the Museum, Public Library, and Reading Rooms. The Museum does not contain anything of very great interest, but the Reading Rooms are particularly comfortable and well-arranged, and being perfectly free to all, are a great boon both to inhabitants and strangers.

There are at present two lines of railway from Cape Town. One extends to Wynberg, the nearest station to Constantia; the other, which is still in course of construction, runs some three hundred miles into the interior, to Beaufort, and is at present open for a distance of about a hundred and thirty miles.

Cape Town is surrounded by suburban villages, most of which are very pleasantly situated, and form a much more desirable residence for invalids than the city itself. Some of the most important are Constantia, Wynberg, Rondebosch, Sea Point, Kalk Bay, etc.

Nothing can be more lovely than the scenery in the neighbourhood of Constantia. The roads between Cape Town and those places are, at first sight, very English in

appearance, owing to their being fringed on either side with trees of various familiar kinds, amongst which the oak of our native shores is conspicuous. These oak trees are, however, not indigenous to the country, but were introduced by early Dutch settlers, and are, in some places, planted so closely together as to form by their over-arching boughs an almost impenetrable screen from the heat of the sun during the summer. We are, however, soon reminded that we are far away from home by the hedgerows of lofty aloes, and of the cactus known as the prickly-pear; while the coloured population of every shade that clusters round the wayside cottages speaks yet more unmistakably of a foreign land. The best wine in the Colony is made at Constantia, and the vineyards are for the most part owned by wealthy descendants of the original Dutch settlers. Both the vineyards themselves and the fine old houses of the proprietors are well worth a visit. The Cape wines, especially the lighter kinds, grown at Constantia, are genuine, wholesome, and palatable; and the visitor should not allow any prejudice he may have previously entertained to stand in the way of his making use of them during his stay, especially as English beers and foreign wines are excessively dear and inferior in quality.*

The street conveyances of Cape Town consist mostly of roomy well-built Hansom cabs, which are very wisely painted white at the top for the sake of coolness. The drivers are, with scarcely an exception, men of colour. Longer journeys are made in the Cape-cart—a two-wheeled conveyance capable of accommodating four or even six people, and furnished with two or four horses. For very

* The genuine Cape wines are very different to the brandied compounds that have found their way into England under that name.

long journeys into the interior ox-waggons are often employed.

There are several hotels in Cape Town, the best of which are perhaps the "St. George" and the "Royal," but the "Masonic" and the "Commercial" are also very respectable houses. The accommodation at all these is fairly good, and the charges are much the same as in England. There are also boarding-houses, at which good accommodation may be obtained for about £2 per week. Lodgings are almost unknown in the Colony.

Cape Town contains a population of about 32,000 souls, of whom nearly half are Europeans; the rest are Malays (descendants for the most part of the servants and slaves of the Dutch East India Company), Kaffirs, natives of Mozambique, Bonny, etc. The true Hottentots are almost, if not quite, extinct, but they have left their impress on the mixed population. The Malays, who nearly all profess the Mussulman religion, are many of them in affluent circumstances. Some of the younger men and women are very handsome, and most of the race possess features of great intelligence. The European population contains, of course, a large proportion of Dutch; there are also many English residents, and a fair sprinkling of French, Germans, and other nationalities.

Taken altogether, Cape Town is an interesting city, and a visitor is little likely to forget his first impressions of its general aspect. The picturesque town, with its magnificent background formed by Table Mountain, and the perhaps still more striking Lion Mountain—the variety of the population, presenting every shade of colour, from the ebony black of the negro to the scarcely noticeable bronze of the half-caste Malay—the gorgeous colours in which the women love to dress themselves—the curious head-dresses of the men—the semi-tropical fruits, flowers, and vegetation,—all combine to form a picture upon which

the memory will dwell with pleasure for many a long year.

Port Elizabeth, the second port of Cape Colony, is situated in Algoa Bay, about 500 miles east of Cape Town. The bay, which is bounded by Cape Padrone on the east and Cape Recife on the west, while protected from the north-west gales, is exposed to those from the south-east, and although somewhat sheltered by a few rocky islets, it is at present far from a desirable harbour. Much expense has been incurred in the attempt to improve it, but hitherto with only partial success, owing in a great measure to shifting bars of sand in the bay. Port Elizabeth is a busy thriving town, with a population of over 13,000 inhabitants, and, considering how recently it was founded, it has grown more rapidly than almost any other town in the Colony. It possesses several churches, banks, and insurance offices; a hospital, barracks, gas-works, etc.; and, if only provided with a good harbour, would no doubt become a place of very considerable importance, especially as it is the terminus of a railway towards the interior, some portions of which are already open for traffic.

As Port Elizabeth is at present the best port for Grahamstown, Cradock, Bloemfontein, and other favourite health-resorts of South Africa, it is of considerable importance to the invalid visitor to the Cape; but it must be borne in mind that the air of Port Elizabeth itself is perhaps one of the worst in South Africa for chest complaints, and that the stay there should be as short as possible.

There are two lighthouses in Algoa Bay—one on Cape Recif and the other on Bird Island.

East London, the next port in importance to Port Elizabeth, is the seaport of British Kaffraria, and is situated at the mouth of the Buffalo river, about 700 miles east of Cape Town. Although the anchorage is at present open and exposed, extensive harbour-works are in course of

construction; and as East London is the terminus of the partially completed railway to Queenstown (distant 160 miles), it is likely to become a place of considerable importance, especially as it is the natural port for King Williamstown and other large towns. At present, however, the landing of passengers is often difficult, and in some states of the wind almost impossible.

NATAL, which is situated on the south-east coast of Africa, to the north of Kaffraria and Basutoland, has a coast-line of some 150 miles, and extends inland for a distance of about 130 miles at its broadest part. It has only one port available for shipping—viz., *Durban*, situated in the harbour of Port Natal. This harbour is sheltered and land-locked, and has a length of about 3½ miles and a width of 2¼ miles, while it is only 600 yards wide at its entrance, which is still partially obstructed by a sand-bar, notwithstanding all that has been expended in attempts for its removal. A lighthouse has been built on a bluff near the entrance.

Durban is the oldest town in the colony, and is regularly built. It has a population of about 6,500. A short line of rail connects the landing-place with the town; there are also iron-foundries, steam-mills, etc.

Pietermaritzburg, the capital of the colony, is about fifty-four miles inland from Durban. It is built on high land, and at some seasons of the year is liable to very severe thunderstorms. The population of Pietermaritzburg is about 6,800.

A contract has been entered into for the construction of a line of railway between Durban and Pietermaritzburg, but at present the communication between the two towns is by means of waggons and omnibuses. A line of telegraph between the port and the capital has however, been open for some years.

The total population of Natal is about 307,000,—of whom 18,600 are whites; 6,700 imported coolies, and 281,700 natives.

The fertility of its soil, and the great variety of the products that can be grown on the successive plateaux into which it is naturally divided, render Natal probably the most flourishing of the South African colonies. On the low-lying district next the coast, cotton, tobacco, coffee, and sugar are successfully cultivated, together with many other tropical and semi-tropical productions. On the plains of medium elevation crops of barley, oats, etc., are raised in great perfection, as well as the fruits and vegetables of Europe; while the highest and most inland plateaux are suitable for pasturage, and supply meat and butter to the more densely populated districts below.

The principal exports of Natal are sugar, wool, cotton, ostrich feathers, hides, ivory, coffee, arrowroot, butter, etc.

The Orange Free State is a republic which owes its existence to Dutch Boers, who, dissatisfied with British rule, migrated northwards from Cape Colony and formed themselves into an independent state. It comprises the territory which lies between the two streams that unite to form the Orange river, and is far removed from the coast; Port Elizabeth, the seaport from which it is most easily reached, being situated more than two hundred miles from its frontier.

The population of the state is believed to be nearly 50,000, of whom about half are Europeans and the remainder natives. Of the Europeans the greater proportion are descendants of the original Dutch settlers.

Some of the highest land in South Africa is to be found in the Orange Free State. The vast undulating plains of which it mainly consists are covered with long grass, and in many districts stretch in unvarying monotony as far as

the eye can reach, while in others they are broken by rocky hills, locally called "kopjes." These plains are admirably adapted for grazing purposes, though, in common with all the high-lying districts of South Africa, they are liable to violent thunderstorms. Diamonds, garnets, and other precious stones are to be found in considerable numbers, though not to the same extent as in the neighbouring district of Griqualand West. Game of every kind abounds, and affords unlimited scope for the energies of those addicted to field sports.

Bloemfontein, the capital and seat of government, is situated on very high ground towards the centre of the state, having an elevation of some 4,000 feet above sea-level. An English missionary bishop resides there, and it possesses two or three churches, banks, etc.; but it is far from imposing as to appearance and size, boasting only a population of about 1,000. There are hotels, but they are expensive, and the accommodation is far from good. A home for consumptive invalids was founded a few years since under the auspices of the Bishop of Bloemfontein.

Bloemfontein can be reached either from Cape Town or Port Elizabeth. The latter is the best route for invalids, and will be more fully described further on.

The Transvaal, or, as it was formerly called, the South African Republic, lies north of the Vaal river, and from this fact it takes its name. Like the Orange Free State, it owes its origin to a migration of dissatisfied Dutch Boers. In 1877 it was formally annexed by Great Britain, since which time public attention has been a good deal directed to its resources, and some little emigration to the colony has taken place. Like the Orange Free State, it is an inland territory, being separated from the coast by Zululand.

The population is believed to amount to about 300,000,

of whom only some 25,000 or 30,000 are whites. The greater number of the Europeans are, as may be supposed, of Dutch origin. The natural characteristics of the country are much the same as those of the Free State, presenting a series of elevated plateaux, which in some districts attain an elevation of as much as 7,000 feet above sea-level. The Transvaal is, however, better timbered, and possesses a greater variety of climate and scenery.

The capabilities of the colony are great and varied. It already supplies large quantities of grain to neighbouring territories, and breeds cattle, horses and sheep in considerable numbers. Gold has been discovered in paying quantities in several districts, both in quartz-reefs and alluvial deposits; and the country also produces silver, copper, lead, tin, iron, cobalt, coal, sulphur, and saltpetre. Coffee and sugar are grown in the warmer and more sheltered districts.

The principal towns are *Potchefstroom*, situated only a few miles north of the Vaal river, and *Pretoria*, which is considerably farther north. The latter is the seat of the local government. Neither of the towns are at present of any importance as to size, but Potchefstroom is said to be pleasantly situated and of picturesque appearance.

The Transvaal is most easily reached by way of Natal, but the difficulty of transit is too great to render it a suitable place of resort for those in delicate health, unless it is intended to settle there.

Climate and Health-resorts.—It must not be imagined that any one visiting South Africa for the sake of its climate has only to land at one of the ports in order to enjoy its full benefits. This is very far from being the case; and indeed the invalid in search of a health-resort should be as careful in his selection of a locality, even for a temporary residence, as he would be under similar cir-

cumstances in England. He must, in fact, bear in mind that there is a greater difference in the climate of the various parts of Cape Colony alone than there is between the health-resorts of the south of England and the Hebrides or the Orkney Islands.

In the first instance the invalid cannot do better than land at Cape Town, and take up his quarters there until he has decided upon his future plans—especially if he should arrive in the Colony at the commencement of the summer, as will be the case if he has left England in the autumn. Here he will be able to obtain good accommodation and most of the luxuries and conveniences of civilization, as well as the best medical advice in the Colony. The climate, although not perfection, is still a good one, and will seldom fail to be of benefit to those suffering from pulmonary complaints.

The future movements of the invalid must be guided by several considerations: viz.,—

1. As to the kind of climate that from his own experience and in the opinion of his medical advisers is most likely to suit his particular case.

2. Whether his state of health is such as to enable him to bear the fatigue and discomforts of a long inland journey, with perhaps very indifferent accommodation when he arrives at his destination.

3. As to the season of the year that is before him.

4. The length of time he intends to remain in the Colony.

If his case is one that is most likely to be benefited by a warm, equable, marine climate of moderate humidity—if his state of health is such as to render a long journey and the discomforts of travelling unadvisable—if his stay in the Colony is to be short—and especially if he has the summer season before him, he cannot do better than remain in the neighbourhood of Cape Town during the whole of

is stay, as there is probably no other climate along the coast, or in the more accessible portions of the country adjacent to it, that is preferable, and certainly no other place where so many comforts are to be obtained.

If, on the other hand, his case is one for which the dry, keen air of the elevated inland districts is most suited—if his constitution is still sufficiently sound to bear the fatigues of travel, and to put up with a good deal of rough accommodation—and if there is plenty of time at his disposal, he may with much advantage visit some of those localities beyond the inland mountain ranges which have been specially recommended for invalids.

Leaving for the present the description of these high plains of the interior, I will now endeavour to give a slight sketch of the climate of the coast regions, with special reference to Cape Town and its neighbourhood.

The district surrounding the base of Table Mountain, and occupying the peninsula lying between Table Bay and Simon's Bay, possesses a climate which is essentially of a marine character. Like most other coast climates, though tolerably equable, it is somewhat humid, the winds from the sea being more or less loaded with moisture. The seasons are of course the reverse of our own—the hottest weather occurring towards the end of January, the coldest about the middle of July. The *winter* is the rainy season in all the coast districts of the Colony; whereas in the inland districts, as will be seen further on, it is the *summer* that is the rainy season. In winter Cape Town and its neighbourhood is damp; it is therefore not so desirable a residence for invalids in winter as in summer. Owing to the reflexion of the heat from the enclosing sides of Table Mountain, Cape Town itself is sometimes unpleasantly hot in summer; but this objection does not apply to some of its suburbs, such as Constantia and Wynberg, which, being situated on the other side of the

spur of the mountain, and being moreover well wooded, are pleasant summer resorts.

Cape Town is visited from time to time by violent winds from the south-east, which have received the name of the "Cape Town doctor," because by them the streets are cleansed from any noxious effluvia that might be the cause of disease. It is to these winds that the immunity of the town from most epidemics is believed to be largely due, especially as the arrangements as to drainage and water supply are by no means perfect. But however advantageous these winds may be in a sanitary point of view, they are by no means well suited to invalids who are suffering from pulmonary complaints. Not only do they blow with extreme violence, but they carry with them clouds of dust, which may prove very irritating to the bronchial mucous-membrane. Delicate persons should therefore as much as possible avoid going out in these winds; and it may even be necessary for them to remain in the house for days together during their continuance. The suburbs of Cape Town are in a great measure sheltered from these winds; and in this respect, as well as from their greater coolness, they will prove a much more desirable summer residence for invalids than the town itself. In the winter season, however, these places, owing to the number of trees by which they are surrounded, are even more damp than Cape Town itself. In all the coast districts the time of sunset is said, on account of its dampness, to be trying to invalids, who should therefore avoid being out of doors at that hour.

In South Africa the spring months—viz., September, October and November—are the pleasantest for Europeans; the heat is not then oppressive, vegetation is at its freshest, and the profusion of wild flowers will be a constant source of pleasure to those who take an interest in such things.

Those who find the climate of Cape Town and its

neighbourhood unsuited to their constitution, or who, having spent the summer there, wish to avoid the winter rains, cannot do better than turn their attention to the high-lying districts in the north-eastern portions of Cape Colony, or the high plains of the Orange River Free State. All these districts are best reached by way of Port Elizabeth, to which port steamers belonging to the Union Company and to Messrs. Donald Currie and Co. run several times each month. The passage usually occupies two or three days, and is sometimes rather rough and unpleasant; the landing, too, in Algoa Bay is occasionally somewhat difficult, but not sufficiently so to prevent even invalids, unless very ill indeed, from undertaking the voyage.

Port Elizabeth, as has been previously mentioned, is one of the worst places for invalids to be found along the coast. It will be advisable, therefore, to push on at the earliest opportunity to *Grahamstown*, a distance of about eighty-five miles. The journey thither can be made by coach in one day, and good accommodation is to be had there. The climate of Grahamstown, although somewhat humid, and partaking to a certain extent of the characteristics of the coast regions, is, on the whole, a pleasant one. The town is situated on a plain about 1,700 feet above sea-level. The distance from the coast in a direct line is only about twenty-five miles; the new harbour in course of construction at Port Alfred being only about twenty-eight miles distant. The town contains some 8,000 inhabitants; and besides churches possesses banks, military barracks and other public buildings. It is the seat of an English bishopric, and there are forty-eight clergymen in the district. Good waggon-roads connect Grahamstown with various other places, and render it a good point of departure for the interior. The principal hotels are "Wood's," the "Masonic," and Belman's "Commercial.' There are also private boarding-houses.

After a good rest at Grahamstown, the invalid cannot do better than proceed to *Cradock*, 115 miles further towards the interior. During the latter part of the journey the Great Winterberg range of mountains will have been crossed, and the traveller will now find himself upon an inland plateau possessing an elevation of some 3,000 feet above sea-level. The town of Cradock is situated upon the Great Fish River, and has a population of about 2,000. Very fair accommodation is to be obtained there, and the climate of the district is probably one of the best for pulmonary complaints to be found in the whole of South Africa. The invalid may, therefore, safely take up his quarters there for as long as he feels inclined to do so, and, should he not care to encounter the fatigues of further travel, he may with advantage remain there during the whole winter.

If, however, he should wish to go farther into the interior, he may push on to *Colesberg* (a town of 1,400 inhabitants), situated some 230 miles north of Cradock.

From thence he can travel by easy stages to *Bloemfontein*, the capital of the Orange Free State (see p. 213), and one of the most celebrated of the South African health-resorts.

It must, however, be borne in mind that, as a general rule, the further the invalid recedes from the coast the more difficult he will find it to obtain good accommodation and those comforts and luxuries that are required in illness.

The conveyances that are available for passenger-traffic between the coast and the interior are of several kinds.

The railway, which is eventually to connect Port Elizabeth with Cradock, is still unfinished, but portions of that to Graaff Reynet are already open.

Cobb and Co.'s coaches leave Port Elizabeth twice a week for the diamond fields, passing through Grahamstown and Cradock, and are comfortable conveyances.

Passenger-carts occasionally run between Port Elizabeth, Grahamstown and Cradock.

The mail carts also take passengers under certain circumstances. This is the quickest mode of conveyance; but should only be adopted by those in robust health, as the wear and tear of travelling continuously for long distances, without proper time being allowed for rest and refreshment, is very great.

Those who, contemplating a long journey into the interior, prefer to travel by their own private conveyance, will have two courses open to them. They can either follow the example of Mr. Anthony Trollope during his journey through the South African colonies, and purchase a Cape-cart and a team of horses, selling them for as much as they will fetch at the end of the journey; or they can adopt the patriarchal Dutch plan of travelling by bullock-waggon. The latter method, though very tedious, is said to be exceedingly pleasant, and is well adapted for large parties with much baggage. The huge covered waggon serves for travelling by day, and provides sleeping accommodation, if necessary, at night, while preserved provisions and any other comforts that may be required during the journey can be carried in any quantity. It need scarcely be mentioned that the two latter modes of travelling are expensive, and are only suited to those with ample means.

The Orange Free State can be reached not only from Port Elizabeth, but also from Cape Town by the coaches that run to the diamond fields, from whence the rest of the journey can be accomplished by mail cart; but this route is so fatiguing as to be quite unsuited for an invalid.

As regards the *climate* of the elevated plains of the interior, unfortunately few trustworthy and systematic records are to be obtained relating to the principal health-resorts. A few facts, however, seem to be well established. One of these is the extreme *dryness* of the air in these districts. At Graaff Reynet, for instance, the mean annual percentage of humidity is only 55·98°, whereas at Cape Town it is 72·00°. During the winter little, if any, rain falls, and the air is light, keen, bracing, and invigorating. The nights are cold, but in the middle of the day the sun is often extremely powerful. The daily range of temperature is very considerable, but owing to the great dryness of the air this does not seem to act prejudicially upon consumptive patients ; on the contrary, in all parts of the colonies testimony is forthcoming as to the wonderfully restorative effects of the climate of these districts in cases of pulmonary disease that had previously been considered hopeless. In summer these regions are visited by thunderstorms of great violence, often accompanied by deluges of rain. These storms cool the air, and render it cool and pleasant for a time, but in the intervals the heat is sometimes intense. All these districts are subject to long-continued droughts, which are very destructive to vegetation. On the whole, the high-lying plains of the interior are not so desirable for a summer as they are for a winter residence for invalids, although, all the year round, they appear fairly suitable to most constitutions.

The following table will show at a glance the great differences which exist between the climate of Cape Town and that of Graaff Reynet, the only high-lying station at which anything like regular meteorological observations appear to have been taken.

*Abstract of Mean Annual Results from the Meteorological Stations at the Royal Observatory, near Cape Town, and at Graaff Reynet, in the Sneeuwbergen Mountains.**

Meteorological Observations.	Royal Observatory.	Graaff Reynet.
	Deg.	Deg.
Mean height of barometer (corrected) .	30·031	27·508
Mean annual temperature	62·38	64·41
Mean daily range	14·11	24·52
Highest recorded temperature . . .	99·5	105·0
Lowest " "	39·8	28·0
	Per cent.	Per cent.
Mean annual humidity (9 a.m., 1 and 5 p.m.)	72·00	55·98
	Inches.	Inches.
Mean annual rainfall	22·476	13·196
Mean annual number of thunderstorms .	15	23
	Feet.	Feet.
Height of the stations above sea-level .	37	2,517

By the above table the following facts are brought into prominence: viz., that while the mean annual temperature of Graaff Reynet is only about two degrees higher than that of Cape Town, the mean daily range is nearly ten degrees greater; that the mean annual humidity of Graaff Reynet is rather more than 16 per cent. less than at Cape Town; and that the rainfall at the latter place is some 9¼ inches more than at the former.

It now only remains to add a few general remarks as to the influence of the climate of South Africa on disease. Unfortunately the statistics bearing on this subject are very imperfect, but the following are a few of the facts that appear to have been established. Asiatic cholera, yellow fever, and hydrophobia are unknown in the Colony; the liver diseases of tropical climates are rare; small-pox, measles, and scarlatina occur occasionally in an epidemic form, but not so frequently as in England; typhoid fever occurs from time to time, but is probably not so prevalent

* From the Appendix to the "Colonization Circular" for 1877.

as in Europe; while dysentery and diarrhœa are rather more frequent, as are also some nervous disorders such as neuralgia. But it is as regards lung diseases that the climate of South Africa compares most favourably with that of Europe. In the tables, compiled by Major Tulloch from observations extending over twelve years, it is shown that only 82 per 1,000 of the white troops stationed on the Cape frontier were attacked by lung disease, as compared with 148 per 1,000 of the troops stationed in the United Kingdom. The deaths from the same class of diseases were at the Cape only 2·4 per 1,000, whereas in the United Kingdom they were 7·7 per 1,000.

There can, in fact, be little doubt that upon lung diseases of every kind, including phthisis in all its stages, the various climates of the Cape, when selected with judgment, are capable of exerting a most beneficial, and in many cases a curative effect, and it is to be regretted that the advantages of the Colony in this respect have not been more freely tested by invalids in this country.

The climates of Natal and the Transvaal have not been specially alluded to in the foregoing short account of the health-resorts of South Africa, because that of Natal would not seem to possess any special characteristics that would render it a particularly desirable residence for invalids (the coast districts being less favourable to the health of Europeans than those in the neighbourhood of Cape Town, and the elevated inland plateaux being considerably more humid than those of Cape Colony), while the climate of the Transvaal is very similar to that of the more accessible Orange Free State, and most of the particulars given as to the climate of the latter will apply equally well to that of the former.

Although the disturbing influences of the unhappy Zulu war, which so thoroughly unsettled the South African colonies during the past year or two, may perhaps have

caused some interruption in the arrangements as to conveyances, etc., that have been mentioned above, and have rendered the resources of the country, for the time, less available for invalids, yet there can be little doubt that any such derangement is only temporary. Now that peace is restored, not only will any interrupted lines of communication be speedily re-opened, but, owing to the public attention drawn to this part of our colonial possessions, a fresh impetus will in all probability be given to the construction of railways and the provision of other means of inland conveyance, while there is also every reason to expect that the tide of emigration will set more strongly towards our South African colonies than it has done for some time past.

The following books give much valuable information with regard to the Cape, and may be consulted with advantage by any of my readers who wish for a more detailed description of any of the colonies: Silver's "Handbook for South Africa," the Government "Colonization Circular," Trollope's "South Africa," and "A Year's Housekeeping in South Africa," by Lady Barker.

CHAPTER XIV.

THE METEOROLOGY OF THE OCEAN.

Instruments required for taking observations—Barometer—Thermometer—Thermometer screen—Hygrometer—Method of determining the humidity of the air—Observations of shade-temperature—Surface temperature of the sea—The meteorological journal—Estimation of the amount of cloud—Direction and force of the wind—Observations of rainfall not reliable—Special meteorological conditions at sea—Distribution of storms—Log and meteorological tables of a voyage to Australia—Log, meteorological tables, and weather-report of homeward voyage by Cape of Good Hope.

THOSE who feel inclined to study the meteorology of the ocean on their own account will find the subject one of great interest.

The instruments required will be a barometer and a good thermometer,—or preferably a pair of dry and wet-bulb thermometers, with a small louvre-boarded screen to protect them from the direct rays of the sun. Maximum and minimum thermometers, and a rain-gauge mounted on "gymbals," may be added if desired; and a meteorological journal should be provided, in which to enter the observations taken.

The barometer may be an aneroid, as this is not only the least expensive and most portable form of instrument, but also the easiest to read. It will give the *relative* changes of atmospheric pressure with the same precision as a more expensive and less handy instrument; but it must be borne in mind that for accurate scientific observations it is necessary that an aneroid should be frequently

compared with a standard mercurial barometer and corrected by it. The aneroid should be secured to one of the bulkheads (*i.e.* partitions) of the cabin in such a way that it will not swing independently of the movements of the vessel. It should also be placed in a good light, and at a convenient height for reading. The best aneroids, compensated for temperature, cost five guineas each; but a sufficiently good one for ordinary purposes may be obtained for from two to three pounds.

The thermometer should be a mercurial one, as it is more sensitive and less likely to get out of order than a spirit thermometer. A standard mercurial thermometer, with a Kew certificate, costs £1; but a fairly good one may be obtained for five or ten shillings.

In order to protect the thermometer from the direct rays of the sun, it should be suspended in a small wooden screen, to which the external air is freely admitted by means of a louvre-boarded front and sides. The screen may be obtained to order through a meteorological instrument maker, or can be made by any intelligent carpenter at the cost of a few shillings. The front, which should be made to open on hinges, in order to allow the readings to be taken, may be secured by a lock and key. The back of the screen should be provided with cross slips of wood, for the purpose of keeping it slightly separated from the surface against which it is fixed. The dimensions of the screen should be such as to freely accommodate the thermometer or thermometers it is intended to employ.

The selection of the position in which the thermometer screen is to be placed is of considerable importance, and on board a ship is often a matter of some difficulty; but the courtesy of the captain and officers will generally afford facilities to those who wish to make scientific observations. The screen should be placed in the open air, at a height of from four to five feet above the deck;

and in the case of a steamer, care must be taken that the thermometers are not influenced by the heat from the engine-room or funnel.

In order to determine the humidity of the air, it is necessary, instead of a single thermometer, to employ the arrangement known as a Mason's hygrometer. This instrument consists merely of a pair of ordinary thermometers, reading exactly alike, and fixed vertically on a wooden back, a few inches apart. The left-hand thermometer gives the temperature of the air in the shade, and is known as the "dry-bulb" thermometer. The right-hand thermometer is called the "wet-bulb" thermometer, because its bulb is intended to be kept in a constantly moist state. This is effected by means of a covering of muslin and a wick conveying water to it from a little bottle that is supplied with the instrument. The wet-bulb thermometer gives the temperature of an evaporating surface. In order to place the covering on the thermometer-bulb take a small piece of perfectly clean muslin about an inch square, and after dipping it in distilled water (or clean rain-water), wrap it closely round the bulb in such a way as to completely cover it, then secure it with a piece of cotton tied round the stem of the thermometer, just above the bulb. The covering is now complete. Next take four threads of coarse darning-cotton, each about ten or twelve inches in length, dip them in distilled water, place them side by side, and then double them. There will now be a loop at one extremity and eight ends at the other. Pass the eight ends through the loop, and place the noose thus formed round the stem of the thermometer just above the bulb, where the single thread confining the muslin had previously been tied. It now only remains to fill the little bottle with distilled water—rain-water if perfectly clean will answer—and to place all the eight ends of the wick in it in such a way as to absorb the water and distribute it over

the muslin covering of the bulb. Although this is a long description, the process itself will be found very simple.

In order to obtain perfectly satisfactory results, the following hints should be borne in mind :—1. The bottle should be kept constantly supplied with water ; 2. In putting on a new covering the hands should be perfectly clean ; 3. The covering should be renewed as often as it becomes discoloured ; 4. The noose of the wick must not be drawn too tight round the stem of the thermometer, or the passage of the water through it will be checked.

The humidity of the air is determined by the difference between the readings of the dry and wet-bulb thermometers. When the air is dry evaporation goes on briskly from the wet surface of the muslin covering the wet-bulb thermometer; and this, by a well-known physical law, reduces the temperature of the mercury contained in the bulb. When, on the other hand, the air is saturated with moisture, evaporation is altogether checked, and the two thermometers will indicate the same temperature.

The "Hygrometer Tables" prepared by James Glaisher, Esq., F.R.S., may be obtained of the publishers, Messrs. Taylor and Francis, price half a crown. These give at a glance the relative humidity of the atmosphere for all temperatures of the wet and dry-bulb thermometers, complete saturation being represented by 100.

As a rough guide for determining the amount of moisture in the air *at sea*, it may be stated that a difference of two degrees or less between the dry and wet-bulb readings at noon indicates unusual humidity ; when the two thermometers read alike the atmosphere is completely saturated with vapour ; when the difference amounts to four or five degrees it may be considered about the average ; when the difference is six degrees it shows that the air is dry ; and when it reaches eight degrees or more it may be regarded as unusually dry.

In taking an observation of the shade temperature by the dry-bulb thermometer, it should be carefully noticed that the bulb is bright and undimmed by any deposition of spray or mist. Should there be any appearance of moisture, the bulb should be carefully wiped with a soft handkerchief and the reading taken in a quarter of an hour or twenty minutes from that time.

The temperature of the surface of the sea may be taken by simply baling up a little water by means of a small bucket, which may be easily extemporised from any tin capable of holding a pint or two of fluid. A good mercurial thermometer should be plunged in the water immediately after it is drawn up, and held in it for fully one minute, when the temperature should be carefully noted. A bucket made of canvas is very convenient, as it possesses the advantage of portability when travelling.

The meteorological journal should be ruled in columns for the reception of the observations taken each day. The first column should contain the date, the second and third the latitude and longitude, the fourth the barometer, the fifth the surface temperature of the sea, the sixth and seventh the dry and wet-bulb temperatures, the eighth the relative humidity (which may be ascertained from the hygrometrical tables and entered at any time afterwards), the ninth for the amount of cloud, the tenth and eleventh for the direction and force of the wind, and the remaining space for a short description of the weather prevailing at the time of the observation. On an adjoining page may be entered a description of the weather of the previous twenty-four hours, including the highest and lowest temperatures if maximum and minimum thermometers have been added to the collection of meteorological instruments.

All the observations should be taken each day at the same hour or hours, and at once entered in the journal. In ordinary weather one observation taken at noon will

be quite sufficient, but during the prevalence of unusual weather more frequent observations will be of advantage; and an entry each evening giving a brief description of the weather that has prevailed during the day will greatly increase the value and interest of the journal.

In estimating at any time the amount of cloud in the sky, only the upper half of the visible heavens is to be taken into consideration. If this upper portion of the sky be cloudless, the amount of cloud should be entered as 0; if two-tenths be covered it should be entered as 2; if half be covered as 5, and so on: total obscuration of the sky by cloud being represented by 10.

For the direction and force of the wind a passenger cannot do better than consult one of the officers on duty at the time, as considerable experience is required accurately to determine either of these points. The direction of the wind should be according to the true, not the apparent, or magnetic, meridian. The force is estimated according to the "Beaufort scale," which ranges from 0, representing a dead calm, to 12, which is the most violent hurricane that can blow.

It will be noticed that in the form recommended for the meteorological journal no column has been set apart for the record of the daily rainfall. It has been omitted because it is so difficult to obtain a good position in which to place the rain-gauge, added to which the movements of the ship, the draughts from the sails and various other causes are so likely to prove sources of error that the observations cannot be regarded as reliable, and are therefore scarcely worth the trouble they involve. At the same time an interesting field of inquiry is open to those who by their ingenuity could overcome these difficulties.

On a page at the commencement of the journal should be inserted a short description of the instruments used; their known errors; the names of the makers; their

position with respect to surrounding objects, their height above deck, with any other particulars that may be considered to affect their readings.

To any one who has not previously taken meteorological observations, the foregoing directions may appear somewhat complicated and troublesome, but in practice this is not the case, and ten or fifteen minutes each day will be amply sufficient for taking all the observations and entering them in the journal, while the amusement and interest that will be derived from the study of the weather at sea will go a long way towards relieving the monotony of a long voyage.

The few instruments named may be obtained of any good meteorological instrument maker. Of those in London, Messrs. Negretti and Zambra, of Holborn Viaduct, and Mr. L. Casella, of Holborn Bars, may be named as thoroughly trustworthy.

The following are a few hints which may be found of interest in connection with the various instruments as illustrating some of the special meteorological conditions that prevail at sea.

Barometer.—Several interesting facts as to the variations of barometric pressure will be noticed during a voyage to Australia.

1. In the tropics, and particularly near the equator, the range of the barometer is very slight, extending only to a few tenths, except on very rare occasions, such as the occurrence of a hurricane; whereas in both temperate zones (as in England) the mercury ranges through a space of two inches or more.

2. The mean atmospheric pressure is considerable higher during a voyage to Australia than it is in England. This is partly due to the high readings and small range during the tropical portions of the voyage. The position of the instrument, a few feet only above sea-level, also increases the actual indicated pressure; and this, though

immaterial as regards meteorological comparison (observations taken at all stations being reduced to sea-level), is believed to be of importance as affecting the physical condition of those at sea.

3. The "diurnal range" of the barometer, which in the temperate zones is masked by rapid and constant changes of pressure, is perfectly well-marked in the tropics. So regular is sometimes the rise and fall of the mercury, that with a little practice it is said to be almost possible to tell the time by it. The total variation for diurnal range amounts to about one-tenth of an inch, and the fluctuation occurs twice in the twenty-four hours. The first period of maximum pressure is at about 10.30 a.m., the corresponding minimum being between 4 and 5 p.m. The second maximum is at about 10 p.m., and the second minimum at 5 a.m.

4. In the southern hemisphere the behaviour of the barometer with regard to the direction of the wind is exactly the reverse of what it is in the northern hemisphere: *i.e.*, it *rises* for southerly winds and *falls* for northerly winds.

Admiral Fitzroy's remarks, which are so often printed upon barometers in England, can be rendered applicable to the southern hemisphere by substituting north for south throughout. Thus :—

NORTHERN HEMISPHERE.		SOUTHERN HEMISPHERE.	
RISE FOR NORTH N.W., N., N.E., DRY OR LESS WIND.	FALL FOR SOUTH S.E., S., S.W. WET OR MORE WIND.	RISE FOR SOUTH S.E., S., S.W., DRY OR LESS WIND.	FALL FOR NORTH N.W., N., N.E., WET OR MORE WIND.
EXCEPT WET FROM NORTH.	EXCEPT WET FROM NORTH.	EXCEPT WET FROM SOUTH.	EXCEPT WET FROM SOUTH.

Temperature.—The most noticeable fact with reference to the temperature of the air at sea is its equability.

After passing the Bay of Biscay, and getting well away from land-influences, the temperature (which then stands, say, at somewhere about 60° to 65°) steadily and gradually rises as the ship sails southwards, until, near the equator, it attains its maximum of about 84°. It then gradually falls until it reaches its minimum of 40° to 45° in the cold latitudes to the south of the Cape of Good Hope.

By referring to the detailed meteorological observations appended to this chapter, it will be seen how the temperature of the air at sea thus rises by almost insensible gradations day by day as the ship sails southwards from England, and how, after the equator is passed, it again as steadily and gradually falls; presenting none of those sudden and trying variations which we so often experience on land * —variations sometimes amounting to 15° or 20°, or even more, in the twenty-four hours.

Nor is it only from day to day that the changes are so slight; the *daily range* of temperature is also very small. The air at night is but little cooler than it is in the shade during the day, and the thermometer often indicates but a few degrees of difference between the greatest heat during the day and the lowest temperature at night.

At sea the temperature appears generally to reach its daily maximum between 1 and 2 p.m., and its minimum between 3 and 4 a.m.

Humidity.—The amount of moisture in the air at sea is, on the whole, in excess of that on land. But it must be remembered that the humidity of the ocean is altogether different in its character and in its effects upon the constitution to that of inland districts. This is, no doubt, greatly owing to the presence in the atmosphere of saline particles and other constituents only met with at sea, but it is probably also partly due to the fact that the amount of

* Of course, in a steamer the alteration of temperature is more rapid.

moisture is much less variable: the difference between the humidity of the night and day, and also from day to day, being very inconsiderable.

Dew is said to be rarely deposited upon the surface of the ocean itself, but the decks of a ship—and probably all other floating objects—are found to be freely covered with it when the conditions are favourable for its deposition. It obeys, of course, the same laws as it does on land; being precipitated most copiously on clear, calm, cloudless nights, and most sparingly when the sky is covered with cloud or when the wind is high. It is deposited most freely just after sunset, and especially when the temperature of the surface of that portion of the sea over which the ship is passing is lower than the temperature of the air above it. It will always be noticed that those parts of the deck that have been wetted with salt water are the first to become moist.

Rainfall.—As already mentioned, observations of the rainfall at sea are difficult to obtain, and far from reliable. It may, however, be stated in general terms that, except within the limits of the calm-belts, much less rain falls at sea than in most countries situated in the temperate zones, and that less rain falls in the southern than in the northern hemisphere. The number of fine days to be enjoyed at sea will contrast most favourably with the previous experiences of those who have resided in the British Islands.

Storms.—Recent researches have tended to establish the fact that all storms are cyclonic; or, in other words, that they are circular eddies of wind of greater or less diameter.

Most storms possess in common the following characteristics. They rotate much more rapidly near their centre than at their circumference, and have a central space or core, in which a comparative calm prevails. In the northern hemisphere their rotation is with the sun, or in an opposite direction to the hands of a clock; in the southern hemisphere, on the other hand, their rotation is

against the sun, but with the hands of a clock. Besides their rotatory motion, they have also a slower progressive motion, which may cause them to travel a distance of many hundreds of miles.

The following may be given as a few general indications of the distribution and character of the atmospheric disturbances met with in the regions through which a ship passes on its way to and from Australia.

1. Strong winds and occasional gales are met with in the northern region of prevailing westerly winds, especially during the winter months.

2. In the calm-belts and in the trade-wind regions gales are seldom experienced; but short squalls of greater or less violence are frequent in the calm-belts, and occur more rarely in the trade-wind regions.

3. In the southern region of prevailing westerly winds boisterous weather, with occasional heavy gales, may again be expected, especially during the winter. Maury, in his "Physical Geography of the Sea," considers that "we may contemplate the whole system of these 'brave west winds' in the light of an everlasting cyclone on a gigantic scale." But he also states that actual storms are less frequent in the southern than in the northern hemisphere.

4. In returning from Australia by the Cape of Good Hope, the ship's course through the South Indian Ocean is some ten or fifteen degrees to the north of the outward track, and lies either within the calm-belt of Capricorn or on the southern border of the south-east trades. This course will bring the vessel, when nearing the Cape, within the district of the Mauritius hurricanes; and during the first four months of the year, it is possible that one or more of these hurricanes may be encountered at this stage of the voyage; but as they are here at some distance from the focus of the district, they are seldom of extreme violence.

As regards the behaviour of the barometer with reference to storms, it may be stated in general terms that the nearer the storm approaches, the lower the mercury will fall; and that it will continue to fall until the centre of the storm is reached. As soon, however, as the centre of the storm has passed, the glass will begin to rise; but this first rise is often followed by the most violent part of the gale, making true the proverb—

> "First rise after low
> Foretells stronger blow."

The weather immediately preceding a storm is usually warm, cloudy, and wet; that following it cold, bright, and fine.

Appended are two tables of meteorological observations taken on board ship during voyages to and from Australia. The first is extracted from the meteorological log of the ship *Newcastle*—Capt. Chas. Le Poer Trench—and shows the observations taken each day during a voyage from England to Melbourne in the autumn of 1876. It serves admirably to exhibit the gradual and steady increase in temperature that occurs between the English Channel and the equator; and the subsequent equally steady decrease until the southern limits of the passage have been gained. It also illustrates some of the points with reference to the behaviour of the barometer at sea that have been referred to above.

The second series of observations were taken by E. Mawley, Esq., F.M.S., during a voyage from Melbourne to London by way of the Cape of Good Hope. The short description of the weather that is appended to each day's observations, and the careful summary at the end of the table, as well as the figures themselves, give a very graphic picture of the weather that is to be expected in a voyage of this kind.

TABLE I.

*Extract from Meteorological Log of Ship "Newcastle" (Capt. Chas. Le Poer Trench).**

Date (…vil time). 1876.	Position. Latitude.	Position. Longitude.	Wind. Direction. True.	Wind. Force. 0—12	Barometer (corrected and reduced to 32° Fah.)	Temperature. Dry.	Temperature. Wet.	Remarks.
	N.	W.			ins.	°	°	
…t. 15	49° 5′	5° 20′	S.S.W.	4	29·935	59	55	Off the Lizard Point.
, 16	49° 10′	7° 25′	S.	7	29·350	58	57·5	
, 17	49° 10′	7° 20′	S.W.	2	29·490	57	54·5	
, 18	49° 10′	7° 20′	W.N.W.	2	29·665	57	53·5	
, 19	46° 55′	10° 40′	N.W.	5	30·005	58	53·5	
20	44° 5′	12° 35′	N.W.	4	30·065	58	52·5	
21	42° 0′	14° 10′	N.W. by N.	2	30·130	59	54	
22	40° 25′	15° 0′	Calm	0	30·175	64	59	
23	40° 5′	15° 15′	S.S.W.	1	30·060	65	62	
24	38° 30′	17° 10′	S.S.E.	6	29·735	68	64	
25	37° 15′	18° 25′	N.W. by N.	3	29·820	66	60	
26	35° 30′	19° 15′	N.N.E.	2	30·105	68	61	
27	33° 50′	20° 10′	S.E.	4	30·100	71	69	
28	32° 30′	20° 40′	S. by W.	4	29·905	72	71	
29	31° 0′	19° 45′	W.S.W.	4	29·835	72	71	
30	28° 45′	18° 10′	S.S.W.	4	29·905	74	72	Sighted Island of Ferro.
31	27° 55	18° 35′	S.W.	5	29·835	74	72	

* Kindly furnished by the Meteorological Office.

Nov.	1	25° 5′	17° 55′	W.	4	29·935	74	72	
„	2	23° 50′	18° 25′	N.N.E.	2	30·005	75	71	
„	3	22° 35′	19° 5′	N.E.	3	30·030	78	71	
„	4	21° 15′	19° 50′	E.N.E.	1	30·020	81	73	
„	5	20° 15′	20° 5′	N.	2	30·025	75	68	Saw a land-bird.
„	6	18° 25′	20° 35′	N.N.E.	4	29·990	78	74	
„	7	16° 10′	21° 20′	N.E. by N.	4	29·950	82	79	Caught a bat, saw a hawk and a dragon-fly.
„	8	15° 10′	21° 35′	E.N.E.	3	29·980	81	77	Brilliant meteors.
„	9	13° 40′	21° 50′	E.	1	29·905	82	74	Dragon-fly seen.
„	10	13° 30′	22° 0′	S.S.E.	1	29·920	84	79	
„	11	13° 15′	22° 45′	S.E.	1	29·925	83	78	
„	12	12° 25′	22° 40′	E.	3	29·920	83	78	Two waterspouts seen.
„	13	11° 0′	22° 55′	E.S.E.	3	29·900	82	79	
„	14	10° 15′	23° 0′	S.S.W.	1	29·980	78	76	
„	15	8° 15′	23° 10′	E. by N.	3	29·965	85	80	
„	16	6° 35′	23° 15′	E.S.E.	2	29·875	80	77	
„	17	5° 45′	23° 55′	S.E.	2	29·880	81	77	Saw a wild duck much exhausted.
„	18	4° 10′	24° 40′	E. by S.	4	29·960	80	77	
„	19	1° 25′	25° 40′	E.S.E.	5	29·980	79	77	Many falling stars.
		S.							
„	20	1° 55′	26° 25′	E.S.E.	5	29·955	79	75	Steady trade winds.
„	21	5° 30′	26° 40′	E.S.E.	4	29·945	79	75	Very brilliant meteors.
„	22	8° 10′	27° 15′	S.E. by E.	4	30·025	80	75	Saw a land-bird like a cuckoo.
„	23	11° 5′	27° 35′	E. by S.	4	30·055	79	75	
„	24	14° 10′	28° 5′	S. by W.	4	30·050	78	74	Losing the trades.
„	25	16° 30′	28° 35′	E. by S.	4	30·055	78	74	
„	26	18° 35′	28° 50′	S.E. by E.	2	30·125	77	75	
„	27	20° 0′	28° 55′	E.	1	30·125	78	76	Sighted the Island of Trinidad.
„	28	22° 10	29° 25′	E.N.E.	3	30·135	77	73	Large numbers of flying fish.
„	29	24° 15′	28° 55′	N. by W.	4	30·015	76	73	

TABLE I. (*continued*).

Date (civil time).	Position.		Wind.		Barometer corrected and reduced to 32° Fah.	Temperature.		Remarks.
1876.	Latitude.	Longitude.	Direction. True.	Force. 0—12		Dry.	Wet.	
	S.	W.			ins.	°	°	
Nov. 30	26° 40′	27° 5′	N.N.E.	5	29·930	73	72	
Dec. 1	28° 15′	25° 25′	S.W. by W.	2	30·015	68	64·5	
„ 2	29° 45′	24° 25′	S.W.	3	30·060	65	60·5	Very brilliant meteor.
„ 3	32° 5′	23° 10′	W. by S.	3	30·005	64	60·5	Several whales.
„ 4	34° 5′	22° 20′	N.	6	29·843	64	61	
„ 5	37° 5′	18° 35′	W.S.W.	4	29·950	57	53·5	Brilliant meteors.
„ 6	38° 10′	16° 30′	N.E. by N.	4	30·190	59	53·5	
„ 7	39° 10′	13° 50′	N.E.	1	30·040	59	56·5	
„ 8	40° 40′	9° 50′	N.E. by N.	6	29·865	56	55·5	Saw tern and divers.
„ 9	41° 5′	5° 40′	N.N.W.	3	30·070	55	54·5	
„ 10	41° 20′	1° 40′	N.	4	30·145	56	55·5	
		E.						
„ 11	41° 30′	2° 10′	N.N.W.	4	30·095	55	54·5	
„ 12	41° 20′	5° 20′	S.W.	4	30·105	—	—	
„ 13	41° 40′	10° 45′	N.W. by N.	5	29·735	54	54	
„ 14	41° 35′	15° 55′	W.S.W.	5	29·378	52	48·5	
„ 15	41° 35′	19° 50′	S. by W.	3	29·555	46	46	
„ 16	41° 45′	23° 30′	N.N.W.	4	30·010	—	—	
„ 17	42° 5′	28° 20′	N.	5	29·785	61	59	
„ 18	42° 15′	32° 30′	W.S.W.	2	29·785	54	51	
„ 19	42° 25′	35° 20′	N.W.	4	29·795	54	53	

Dec. 20	42° 30′	40° 30′	N.W. by N.	5	29·580	53	53	
„ 21	42° 40′	46° 50′	N.	6	29·470	55	54	
„ 22	42° 40′	50° 50′	N. by E.	2	29·315	48	47	Quantity of sea-weed.
„ 23	42° 50′	55° 0′	W.	4	29·220	50	48	
„ 24	42° 40′	59° 55′	W.	6	29·530	49	45	
„ 25	42° 40′	64° 55′	N. by E.	6	29·575	52	51	
„ 26	42° 35′	68° 55′	S.W. by W.	4	29·965	56	56	Brilliant meteors.
„ 27	42° 30′	73° 15′	N.W. by N.	5	30·120	58	56	
„ 28	42° 30′	78° 30′	N.W. by W.	5	29·935	56	55	
„ 29	42° 25′	83° 35′	S.W. by W.	5	29·990	51	48	
„ 30	42° 35′	88° 20′	N.W. by N.	6	29·855	55	54	
„ 31	42° 45′	93° 35′	N.W. by N.	6	29·755	54	53	
1877								
Jan. 1	42° 50′	98° 45′	W.S.W.	6	29·735	50	48	Much sea-weed.
„ 2	42° 30′	104° 0′	W.	7	29·790	53	51	
„ 3	42° 35′	108° 40′	W.S.W.	4	29·685	51	50	
„ 4	42° 30′	113° 0′	W.N.W.	4	29·580	54	52	
„ 5	42° 35′	118° 25′	W. by S.	8	29·215	54	51	
„ 6	42° 55′	124° 10′	W. by S.	4	29·580	52	48	
„ 7	42° 45′	129° 5′	N. by W.	7	29·520	57	55	
„ 8	42° 25′	133° 50′	S.W.	4	30·050	54	50	Water green, land birds and fish.
„ 9	41° 0′	135° 45′	N.E. by N.	2	29·965	57	52	Brilliant meteor.
„ 10	40° 45′	137° 30′	W.	3	29·635	58	56	
„ 11	39° 25′	141° 20′	W. by S.	5	29·785	62	56	Sighted Cape Ottway.

TABLE II.

Meteorological Observations taken on board the "Sobraon" (Capt. J. A. Elmslie, R.N.R.) by E. Mawley, Esq., F.M.S., *during a voyage from Melbourne to London viâ the Cape of Good Hope.*

DATE.	LOG.			METEOROLOGICAL OBSERVATIONS. (Taken each day at noon.)					
							Wind.		
1875.	Latitude. S.	Longitude. E.	Distance since previous noon.	Barometer (corrected)	Temperature of air in shade.	Humidity of air in shade.	Direction.	Force.	REMARKS.
			miles.						
Feb. 14	......	......	......	......	......	......	......	......	Land last seen.
" 15	......	......	......	29·93	......	......	......	......	
" 16	39° 10′	142° 8′	(a) 126	30·00	......	......	S.	5	Bright, but cool.
" 17	39° 6′	139° 53′	106	30·06	59° 4′	......	S. by W.	3	Bright, but cool; sighted King's Island 10 p.m.
" 18	39° 3′	136° 47′	145	30·00	60° 4′	......	E.	2	Bright, but cool.
" 19	39° 14′	135° 50′	58	29·83	60° 6′	73	S.E.	2	Moderately bright, but cool.
" 20	39° 15′	133° 11′	116	29·88	63° 4′	......	W.	5	Bright, and rather warmer.
" 21	40° 22′	129° 56′	166	29·64	59° 4′	76	W.N.W.	7	Moderate gale, max. force of wind 8 p.m.
" 22	39° 26′	128° 41′	78	29·94	59° 7′	77	W.	6	Dull, slight showers.
" 23	39° 12′	127° 0′	79	30·15	57° 5′	81	S.	1	Dull and cold.
" 24	39° 13′	126° 9′	40	30·18	59° 3′	77	E. by N.	2	Dull and cool.
" 25	38° 22′	123° 38′	129	30·10	59° 9′	92	E.N.E.	3	Dull, cold, and wet.
" 26	37° 33′	119° 18′	211	29·87	65° 3′	86	N.E. by N.	6	Bright and warm, strong breeze, heavy rain, early morning.

Feb. 27	38° 1′	115° 36′	177	29·93	59° 6′	94	S.	5	Dull and damp—sea fog—off Cape Leeuwin.
„ 28	37° 30′	112° 40′	142	29·92	61° 7′	67	Z.	0	Bright, but cool.
Mar. 1	36° 22′	110° 5′	142	30·01	63° 7′	78	S.	4	Moderately bright and warm.
„ 2	36° 18′	107° 28′	127	30·16	65° 4′	61	E.	2	Bright, warm, and calm.
„ 3	36° 30′	105° 44′	84	30·18	62° 1′	60	S.	2	Dull, warm, and calm.
„ 4	36° 48′	104° 35′	58	30·07	62° 0′	65	S.W.	1	Dull, warm, and calm.
„ 5	36° 51	102° 52′	84	30·08	63° 2′	67	E.	1 to 2	Bright, warm, and calm.
„ 6	37° 0′	101° 4′	86	30·12	63° 9′	64	S.	2	Bright, warm, and calm.
„ 7	36° 58′	100° 14′	40	30·08	66° 4′	71	W.N.W.	3	Bright but cool; squally evening.
„ 8	36° 21′	96° 30′	184	30·18	61° 1′	67	S.S.W.	4	Moderately bright and cool.
„ 9	36° 19′	94° 13′	111	30·18	62° 6′	68	E.S.E.	1	Moderately bright and cool.
„ 10	36° 16′	91° 44′	121	30·14	66° 0′	78	N.N.E.	3	Bright and warm, showery about 5 p.m., rain at night.
„ 11	36° 20′	89° 35′	105	30·11	66° 5′	92	N.E.	3	Dull showers during evening and at night.
12	36° 32′	84° 5′	227	29·38	66° 3′	93	N.W. by N.	7	Very heavy rain with gale, early morning—a whole gale between 2 and 4 p.m.
„ 13	35° 31′	84° 2′	75	29·82	64° 1′	84	W.	5 to 6	Squally.
„ 14	33° 49′	83° 06′	114	30·10	67° 2′	62	W.S.W.	2	Bright, with slight showers.
„ 15	33° 45′	81° 56′	53	30·20	68° 9′	60			Bright, calm, and warm.
„ 16	33° 47′	80° 46′	58	30·20	68° 5′	69	S.E.	1	Bright, calm, and hot.
„ 17	33° 57′	79° 54′	44	30·13	70° 2′	76	Z.	0	Bright, calm, and hot.
„ 18	34° 6′	79° 5′	42	30·05	70° 3′	73	W.N.W.	2	Bright and warm.
„ 19	34° 3′	77° 45′	67	30·01	68° 5′	83	N.	2	Bright and warm.
„ 20	32° 11′	76° 3′	140	30·06	70° 4′	75	S.W. by S.	3	Bright and warm; small water-spout observed at 7 a.m.
„ 21	31° 30′	74° 58′	68	30·05	72° 6′	72	N.W.	1	Bright and hot.
„ 22	31° 44′	73° 46′	63	29·96	69° 6′	85	Light and variable.	0	Squall at 6.30 a.m., then showery, moist, and dull.

TABLE II. (*continued*).

DATE.	LOG.			METEOROLOGICAL OBSERVATIONS. (Taken each day at noon.)					
							Wind.		
1875.	Latitude. S.	Longitude. E.	Distance since previous noon.	Barometer (corrected)	Temperature of air in shade.	Humidity of air in shade.	Direction.	Force.	REMARKS.
			miles.						
Mar. 23	31° 0′	71° 12′	139	30·06	69° 5′	66	S.S.E.	4	Bright and warm.
„ 24	31° 15′	67° 51′	173	30·18	70° 4′	60	S.E.	4	Bright and warm.
„ 25	32° 0′	64° 3′	200	30·21	72° 1′	79	E. by N.	4 to 5	Bright, warm, and sultry.
„ 26	31° 48′	59° 56′	211	30·08	74° 2′	75	N.N.E.	5	Bright, hot, and sultry.
„ 27	31° 31′	55° 16′	241	29·75	72° 6′	100	N.E.	2 to 6	Heavy rain 4 a.m. till 2.30 p.m. Blowing a gale after 12.30 p.m., which reached its height about 3 p.m.
„ 28	30° 38′	53° 58′	86	29·82	69° 4′	73	W.	4	Bright and warm, passing showers.
„ 29	31° 26′	53° 13′	62	29·90	71° 2′	79	W.	3	Bright and hot, with light wind.
„ 30	32° 25′	52° 55′	62	29·95	73° 9′	74	N.W.	1	Bright, hot, and calm.
„ 31	32° 36′	50° 37′	118	30·10	65° 9′	68	S.	6	Bright, with cool wind.
April 1	32° 56′	45° 30′	261	30·18	67° 4′	64	E.	5	Rather dull, cool dry wind.
„ 2	32° 55′	40° 5′	274	29·78	72° 2′	86	N.N.E.	6	Bright, with fresh wind, occasional light squalls.
„ 3	33° 5′	36° 42′	171	29·65	72° 3′	79	N.W.	6	Bright, with fresh wind, squally, thunderstorm, and heavy squall at 1 a.m.; blowing hard all night.
„ 4	32° 37′	35° 32′	65	30·00	68° 2′	62	S. by W.	5	Bright, with pleasant breeze.

April	5	32° 40′	33° 46′	90	29·97	67° 6′	63	N.E.	3	Rather dull, with dry air.
,,	6	32° 56′	29° 56′	194	30·18	67° 9′	60	S. by W.	5 to 6	Bright, with cool, fresh, dry wind.
,,	7	33° 47′	27° 16′	143	30·16	67° 6′	66	E.	......	Bright (at noon, Cape Recife 70 miles distant).
,,	8	34° 39′	24° 22′	153	30·03	70° 4′	74	E.	4	Bright, damp towards evening.
,,	9	35° 9′	20° 56′	172	29·85	64° 2′	94	N.E.	2	Bright, with damp air; particularly damp during the whole morning.
,,	10	......	......	......	29·88	65° 5′	94	variable	......	Dull, very damp and calm, frequent showers during afternoon.
,,	11	35° 2′	18° 29′	121	29·90	63° 5′	87	S.W. by W.	3 to 5	Bright, and not quite so damp.
,,	12	......	......	......	......	......	......	......	......	Bright and hot, with dry air. Anchored in Table Bay about 3·30 p.m.
,,	13	......	......	......	......	......	......	......	......	Bright and warm.
,,	14	......	......	......	......	......	......	......	......	Bright and hot.
,,	15	......	......	......	......	60° 6′	......	......	......	Cloudy and cool.
,,	16	33° 17′	17° 1′	80	30·00	63° 2′	87	S.W.	......	Bright, cool, light air.
,,	17	32° 20′	14° 56′	121	29·90	63° 7′	72	S.W.	variable	Moderately bright, with cool, dry wind.
,,	18	30° 57′	13° 13′	121	29·97	67° 0′	85	N.W.	1	Tolerably bright, warm, and sultry.
,,	19	29° 40′	10° 33′	159	30·08	65° 4′	68	S. to S.W.	variable	Dull, with dry light wind.
,,	20	27° 59′	7° 3′	210	30·17	67° 5′	76	S.E.	5	Dull and warm.
,,	21	25° 34′	4° 14′	211	30·06	70° 1′	78	S.E.	5	Moderately bright, with soft dry air.
,,	22	23° 37′	1° 26′	193	29·98	72° 2′	71	S.E.	4	Bright and warm; St. Helena at noon N.W.½N., 600 miles distant. During the morning entered the tropics.

TABLE II. (*continued*).

DATE.	LOG.			METEOROLOGICAL OBSERVATIONS. (Taken each day at noon.)					
							Wind.		
1875.	Latitude. S.	Longitude. W.	Distance since previous noon.	Barometer (corrected)	Temperature of air in shade.	Humidity of air in shade.	Direction.	Force.	REMARKS.
			miles.						
April 23	21° 40′	1° 5′	183	29·95	72° 9′	67	E.S.E.	4	Dull and rather sultry; passing showers.
„ 24	20° 21′	3° 0′	140	29·97	76° 6′	62	Z.	0	Bright and hot; St. Helena at noon N. 31° W., 294 miles distant.
„ 25	19° 7′	3° 39′	75	29·98	75° 1′	69	E.	0 to 1	Bright and hot.
„ 26	17° 30′	4° 39′	103	29·98	75° 4′	74	S.E. by E.	3	Bright and hot.
„ 27	......	......	108	......	......	......	......	......	Bright and hot; all day off St. Helena.
„ 28	14° 54′	7° 2′	100	29·94	77° 3′	75	S.E.	3 to 4	Bright and hot.
„ 29	13° 12′	8° 35′	136	29·93	78° 2′	71	S.E.	3	Bright and hot.
„ 30	11° 55′	10° 53′	150	29·94	78° 0′	63	S.E.	......	Bright and hot; very dry air; rain at night.
May 1	10° 14′	12° 44′	149	29·94	76° 8′	79	S.E.	3 to 4	Hot, rather dull and showery; Ascension Island N. 63 W., 170 miles.
„ 2	8° 31′	14° 42′	157	29·90	80° 7′	67	E.S.E.	3 to 4	Bright and hot, with dry air; Ascension Island in sight at sunrise, at noon N. 26 E., 38 miles.
„ 3	6° 29′	16° 8′	155	29·87	81° 5′	64	S.E. by E.	3	Bright and hot.

May 4	4° 31′	17° 18′	132	29·88	83° 5′	72	S.E. by S.	3 to 4	Bright and very hot.
„ 5	2° 33′	18° 46′	148	21·86	82° 6′	76	E.S.E.	4	Bright and very hot; heavy tropical rain between 3 and 4 a.m.
„ 6	1° 0′	20° 2′	120	29·82	81° 5′	81	S.E. by E.	2	Moderately bright and hot; heavy tropical shower about 3 a.m., and again at 11 p.m.
„ 7	N. 0° 7′	20° 59′	94	29·82	85° 0′	72	N.E.	1 to 2	Bright and very hot indeed; heavy tropical shower 10 p.m.; lightning; crossed the Line this morning.
„ 8	0° 56′	20° 54′	55	29·87	78° 5′	89	S.	2	Moderately bright and hot; a heavy thunderstorm at 4 a.m.; vivid lightning.
„ 9	2° 52′	21° 24′	116	29·86	80° 7′	88	N.E.	light airs	Dull, very close and rainy; about 1·30 p.m. a heavy storm came up astern; lost the S.E. trades.
„ 10	3° 14′	22° 11′	53	29·83	82° 5′	76	N.E.	1	Bright and very calm and hot.
„ 11	3° 47′	22° 15′	33	29·87	81° 5′	82	W.S.W.	light airs	Dull, hot, and sultry.
„ 12	5° 2′	22° 15′	83	29·76	74° 6′	95	W.	5	Dull, sultry, very heavy rain from 11.30 p.m. yesterday; rain fell in torrents all last night and throughout the day.
„ 13.	6° 17′	23° 46′	94	29·84	79° 5′	78	N.E. by N.	4	Bright and hot; caught the N.E. trades.
„ 14	7° 51′	26° 6′	168	29·87	78° 3′	78	N.E. by N.	5	Bright and warm.
„ 15	10° 13′	28° 26′	199	29·90	77° 3′	73	N.E. by N.	4	Bright and warm.
„ 16	12° 42′	30° 26′	189	29·83	75° 1′	74	N.E. by N.	4	Bright, with cool wind.
„ 17	15° 40′	32° 33′	217	29·88	73° 5′	77	N.E.	4	Bright, with cool wind.
„ 18	18° 30′	33° 57′	190	29·97	74° 9′	77	N.E.	3 to 4	Bright, with cool wind.

TABLE II. (*continued*).

DATE.	LOG.			METEOROLOGICAL OBSERVATIONS. (Taken each day at noon.)					
							Wind.		
1875.	Latitude. N.	Longitude. W.	Distance since previous noon.	Barometer (corrected)	Temperature of air in shade.	Humidity of air in shade.	Direction.	Force.	REMARKS.
			miles.						
May 19	21° 49′	34° 52′	204	30·09	73° 5′	83	E.	3	Dull, warm, and sultry.
,, 20	23° 45′	35° 9	117	30·10	75° 4′	79	E.	3	Bright, warm, rather sultry; lost the N.E. trades.
,, 21	24° 34′	35° 4′	50	30·12	74° 5′	79	E.	light airs	Dull, warm, and sultry.
,, 22	25° 39′	34° 42′	68	30·11	75° 2′	79	S.S.W.	1	Bright and hot.
,, 23	26° 44′	34° 13′	70	30·07	75° 7′	77	Z.	0	Bright and hot—dead calm—passing showers.
,, 24	27° 31′	33° 58′	40	30·02	74° 3′	73	Z.	0	Bright and hot; passing showers
,, 25	28° 42′	33° 46′	72	30·00	73° 6′	78	W.	1	Bright, hot, and sultry.
,, 26	29° 11′	33° 23′	35	30·03	73° 6′	77	N.W.	1	Bright, hot, and rather sultry.
,, 27	30° 18′	32° 40′	77	30·00	71° 4′	80	W.	1	Bright, cool wind.
,, 28	32° 14′	30° 51′	149	92·99	71° 1′	78	W.N.W.	3	Bright, cool, fresh wind.
,, 29	34° 57′	27° 19′	242	29·94	67° 6′	72	N.N.W.	5	Bright, with cool fresh breeze; St. Mary's N. 42° E. 150 miles. The Lizard N.E. 1,350 miles.
,, 30	34° 33′	23° 23′	195	30·10	67° 2′	77	N.E. by N.	5	Bright, with strong cool breeze.
,, 31	34° 9′	20° 23′	150	29·98	65° 5′	67	N.E. by N.	3	Bright, cool wind.
June 1	34° 48′	21° 25′	64	30·08	68° 7′	62	Z.	0	Bright and warm; dead calm.
,, 2	36° 14′	21° 14′	87	30·08	68° 5′	83	S.W.	4	Bright; steady rain after 3 p.m.

June 3	37° 3′	19° 14′	100	30·18	65° 5′	83	N. by E.	......	Bright, with cool, light airs. Lizard N.E. ½ N. 1000 miles at noon.
„ 4	37° 19′	18° 52′	24	30·20	68° 3′	78	S.E.	1	Bright, warm, and calm.
„ 5	38° 12′	18° 22′	58	30·10	68° 7′	84	W.S.W.	1	Bright, hot, and calm.
„ 6	39° 4′	17° 32′	65	30·13	67° 6′	85	S.	light airs	Bright, warm, and calm.
„ 7	39° 52′	16° 48′	54	30·16	68° 6′	81	S.E.	light airs	Bright, warm, and calm.
„ 8	40° 56′	15° 50′	78	30·18	64° 5′	87	N.W. by N.	5	Bright, strong cool breeze.
„ 9	44° 26′	12° 22′	261	29·94	60° 5′	80	W.	5	Dull and cool; showery.
„ 10	46° 38′	9° 40′	175	29·70	57° 9′	97	S.W.	6 to 7	Dull; strong cool breeze. Start Pt. N. 49° E. 352 miles; Ushant N. 59° E. 220 miles.
„ 11	49° 22′	4° 55′	254	29·72	56° 9′	75	......	......	Moderately bright; strong cold breeze; showery. Start Pt. N.E. 70 miles at noon; sighted 6.30 p.m.
„ 12	......	......	......	......	......	......	......	......	Dull; strong cold breeze; showery evening. Anchored off Margate 4.30 p.m.
„ 13	......	......	......	......	......	......	......	......	Dull, cold, and showery. Off Gravesend at 10 a.m.; reached S.W. India Docks 8.30 p.m.

Summary of Meteorological Observations.

	Inches.
Barometer (corrected for temperature) at noon—Mean	29·989
Highest (25th March)	30·21
Lowest (12th March)	29·38
Range	·83
	Deg.
Temperature of the air in the shade at noon.—Mean .	69·117
Highest (7th May, Lat. 0° 7′ N., Long. 20° 59′ W.)	85·0

N.B.—This was the highest temperature at *any time* during the voyage.

Lowest (11th June, in English Channel) . . .	56·9
Range	28·1

Relative amount of humidity in the air at noon (100 representing complete saturation)—Mean . 77

(On only one day—27th March—was the air completely saturated.)

Least amount of humidity (3rd and 15th and 24th March, and 6th of April) 60

(At no time during the voyage did the wet-bulb of the Hygrometer read more than 8 degrees lower than the dry-bulb).

Wind.—The *Direction of the Wind* indicated in the foregoing tables is its *true* bearing at noon.

The Force of the Wind at noon (estimated according to the Beaufort scale, in which 12 represents a hurricane, and 0 a calm)—Mean . . . . . . 3·2

Greatest (at 3.30 p.m. 12th March, during a gale) . . 10

During the voyage three gales were encountered: (1) A moderate gale on 21st February; (2) A whole gale on 12th March; (3) A strong gale on 27th March. The sea during this last gale was unusually turbulent, rising in irregular heaps all round the ship. Several heavy squalls were met with after this date, but none worthy the name of a gale.

On twenty-eight days during the voyage, either calms or light airs prevailed at noon.

Surface Temperature of the Sea.—During the voyage the surface temperature of the sea was found but seldom to differ more

than 1 or 2 degrees from the temperature of the air in shade. On one day, however (6th April), while in the Agulhas current, the surface temperature was observed to be 6° 7′ higher than the shade temperature of the air. On the following days the surface temperature between noon and 4 p.m. had fallen as much as 10 degrees (71° 7′ to 61° 7′).

Remarks.—During the voyage seventy-eight days were registered as bright, thirty as dull or cloudy, and ten as moderately bright.

Rainfall.—It is much to be regretted that no correct rainfall observations—owing to there being no rain-guage on board—were taken during the voyage. On reference to the daily register, it would appear that during the *day time* unusually heavy rain fell on two days; either heavy or steady rain on eight days; that ten days were showery; and that on six other days there were light showers—leaving *ninety-two days which were quite fine.*

Fog.—On the 27th February a rather dense sea fog prevailed during the greater part of the day; but on no other day was it at all foggy.

APPENDIX A.

OUTFIT REQUIRED FOR A VOYAGE TO AUSTRALIA.

CABIN REQUISITES, etc. (*necessary only in sailing vessels*).

Deal berth-place, *or*
Portable iron bedstead, *or*
Cot or sofa to stand or swing.
Portable washstand and fittings.
Looking-glass.
Mahogany rack with water bottle and tumblers.

⁂ *The above articles are furnished by the* OWNERS *in nearly all sailing-lines.*

Horsehair mattress and bolster.
Horsehair or feather pillow or pillows.
Sheets (?).
Blankets.
Pillow-cases.
Counterpane or railway-rug.

⁂ *Bedding is provided in* A FEW *sailing-lines.*

Towels.
Table-napkins (?).
Portable easy-chair.
Water-can.
Foot-bath or portable sponge-bath.
Cabin-lamp.
Bookshelf.
Carpet, rug, or matting for floor (?).
Curtain for door, ditto for berth (?).

CABIN REQUISITES (*continued*).

Cabin-pocket.
Soiled clothes bag.
Swing-tray (?).
Table (?).
"Storm-basin" (?).
Pictures (?).
Hooks for clothes.
Portable chest of drawers *or*
 Trunks, boxes or portmanteaux.
Store-box (?).

CLOTHES, ETC.

Woollen suits, thick for cold and thin for warm weather.
Thin merino coat for cabin wear (?).
Two overcoats,—1 thick, 1 thin.
Flannel shirts (with collars ?), some thin.
Linen shirts (not recommended for voyage).
Under-waistcoats and drawers.
Collars, Socks (cotton and woollen).
Handkerchiefs.
Boots (1 thick pair for rough weather).
Shoes, leather or canvas.
Flannel pyjama sleeping suits.
Night-shirts (?).
Scarves, woollen comforters, etc.
Hats or caps, cloth. Straw hat (?).
Suit of waterproofs (?).
Brushes, sponges, etc.

STORES AND SUNDRIES.

Candles for lamp.
Soap.
Liebig's extract of meat (?).
Preserved milk (?).
Cocoa (?).
Aperient medicine.

Stores and Sundries *(continued)*.

Effervescing citrate of magnesia (?).
Spirit-stove and methylated spirit (?).
Portable or pocket filter (?).
Writing materials.
Housewife.
Tools, nails, hooks, etc. (?).
Books.

In the above list articles not absolutely necessary are indicated by a note of interrogation.

Note.—In some ships the bedding, linen, towels, etc., and all *necessary* articles of cabin furniture, are provided, if desired, for an extra payment of about £5.

APPENDIX B.

NAMES AND ADDRESSES OF SOME OF THE PRINCIPAL SHIPPING FIRMS.

Anderson, Anderson & Co's line of sailing ships from London to the Australian ports. 5, Fenchurch Avenue, London, E.C.

"Colonial" line of steam and sailing vessels for Australia. John H. Flint, 112, Fenchurch Street, London, E.C.

Donald Currie & Co's Colonial Mail line of steamers from London to Madeira, South Africa, etc. 3 and 4, Fenchurch Street, London, E.C.; 23 and 25, Castle Street, Liverpool: 11, Commercial Buildings, Cross Street, Manchester.

Devitt & Moore's "Australian" line of sailing ships, from London to the Australian ports, 39, Fenchurch Street; or F. Green & Co., 112, Fenchurch Street, London, E.C.

"Elder" line of sailing ships from London to Adelaide. Trinder, Anderson & Co., 110, Fenchurch Street, London, E.C.

Gavin, Birt & Co's "Thames and Mersey" line of sailing ships from London to the Australian ports. 27, Leadenhall Street, London, E.C.

Green's, Messrs., "Blackwall" line of sailing ships for Australia. F. Green & Co., 112, Fenchurch Street, London, E.C.

Houlder, Bros., and Co's line of sailing ships from London and Liverpool to the Australian ports, etc. 4, Oriel Chambers, Water Street, Liverpool; and 146, Leadenhall Street, London, E.C.

Ismay, Imrie & Co's "White Star" line of sailing ships from Liverpool to the Australian ports, etc. 34, Leadenhall Street, London, E.C., and 10, Water Street, Liverpool.

Messageries Maritimes de France, line of steamers from Bordeaux to Brazil and River Plate; also from Marseilles to India, China, etc. London Agency, 97, Cannon Street, E.C.

M'Ilwraith, M'Eacharn & Co's "Scottish" line of sailing ships for Queensland ports, etc. 34, Leadenhall Street, London, E.C.

Money Wigram & Son's line of steam ships to Australia. Messrs. Morgan and Allport, 7, Leadenhall Street, London, E.C.

New Zealand Shipping Company's line of sailing ships from London to the ports of New Zealand. 84, Bishopsgate Street Within, London, E.C.

"Orient" Steam Navigation Company (Limited) line of steamers to Australia. Managers, Messrs. F. Green & Co., 112, Fenchurch Street; and Messrs. Anderson, Anderson & Co., 5, Fenchurch Avenue, London, E.C.

Pacific Steam Navigation Company, Liverpool to Brazil and River Plate. 31, James Street, Liverpool.

Pacific Mail Steamship Co.: American route to Australia, New Zealand, Japan, etc. European offices, Windsor Chambers, Great St. Helens, London, E.C.; C. Clark & Co., agents.

Peninsular & Oriental Steam Navigation Company. 122, Leadenhall Street, London, E.C.; and Oriental Place, Southampton.

"Passengers" line and Albion Shipping Company's sailing vessels for New Zealand ports. Shaw, Savill & Co., 34, Leadenhall Street, London, E.C.

Potter, John & Co's., "Victoria" line of sailing ships, from

London to the Australian ports. 15, Great St. Helens, London, E.C.

"Red Cross" line of steamers from Liverpool to Brazil. Messrs. R. Singlehurst & Co., Redcross Street, Liverpool.

Royal Mail Steam Packet Company, Liverpool to the West Indies, Brazil, and River Plate, etc. J. M. Lloyd, Secretary, 18, Moorgate Street, London, E.C.; and J. R. Linstead, Canute Road, Southampton.

Taylor, Bethel & Roberts', Messrs., "London" line of sailing ships from London and Liverpool to the Australian ports. 110, Fenchurch Street, London, E.C.

Thompson, Geo. & Co's., "Aberdeen" clipper line of sailing ships from London to the Australian ports. 24, Leadenhall Street, London, E.C.

Union Steamship Company (Limited), Southampton to Madeira, South Africa, etc. Oriental Place, Southampton; and 11, Leadenhall Street, London, E.C.

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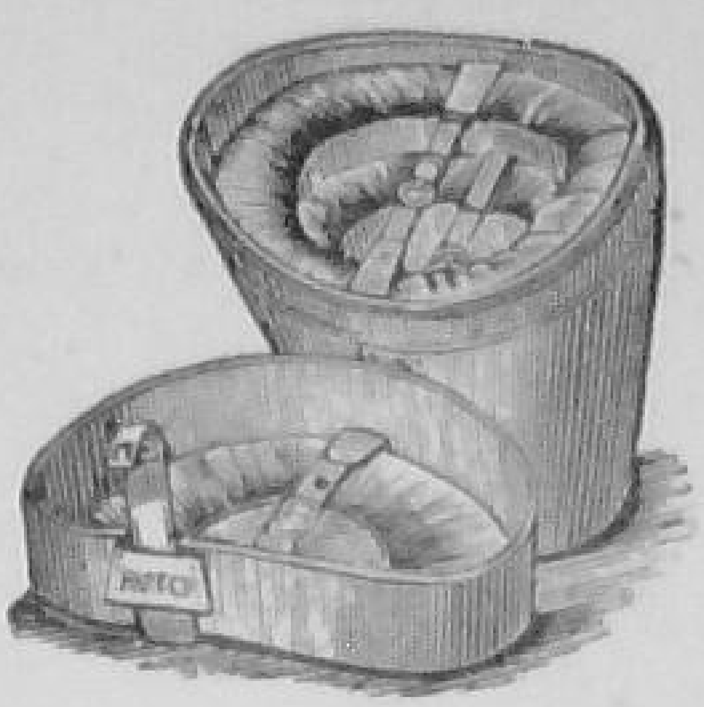

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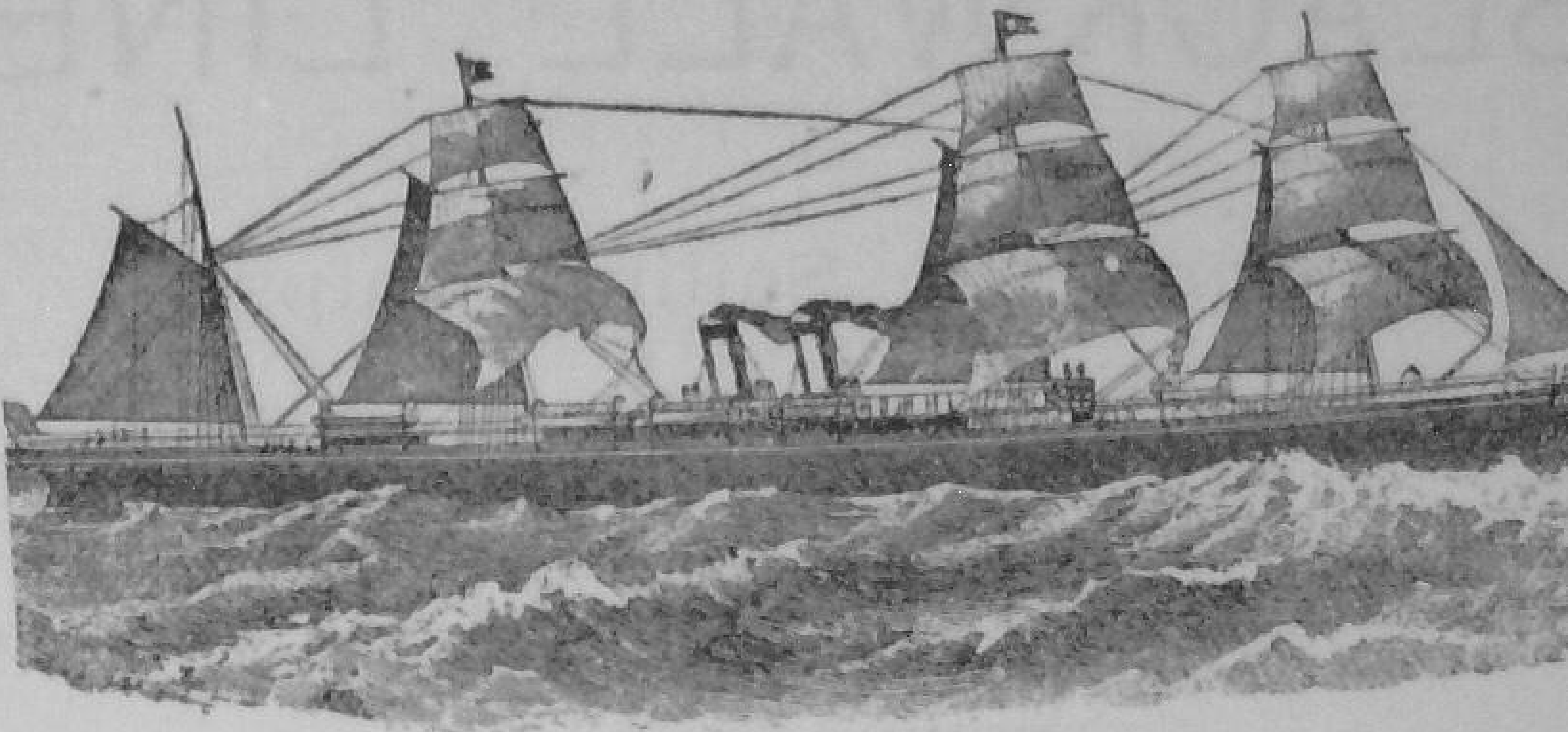

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